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Motor-World

3TOL

MOTOR WORLD

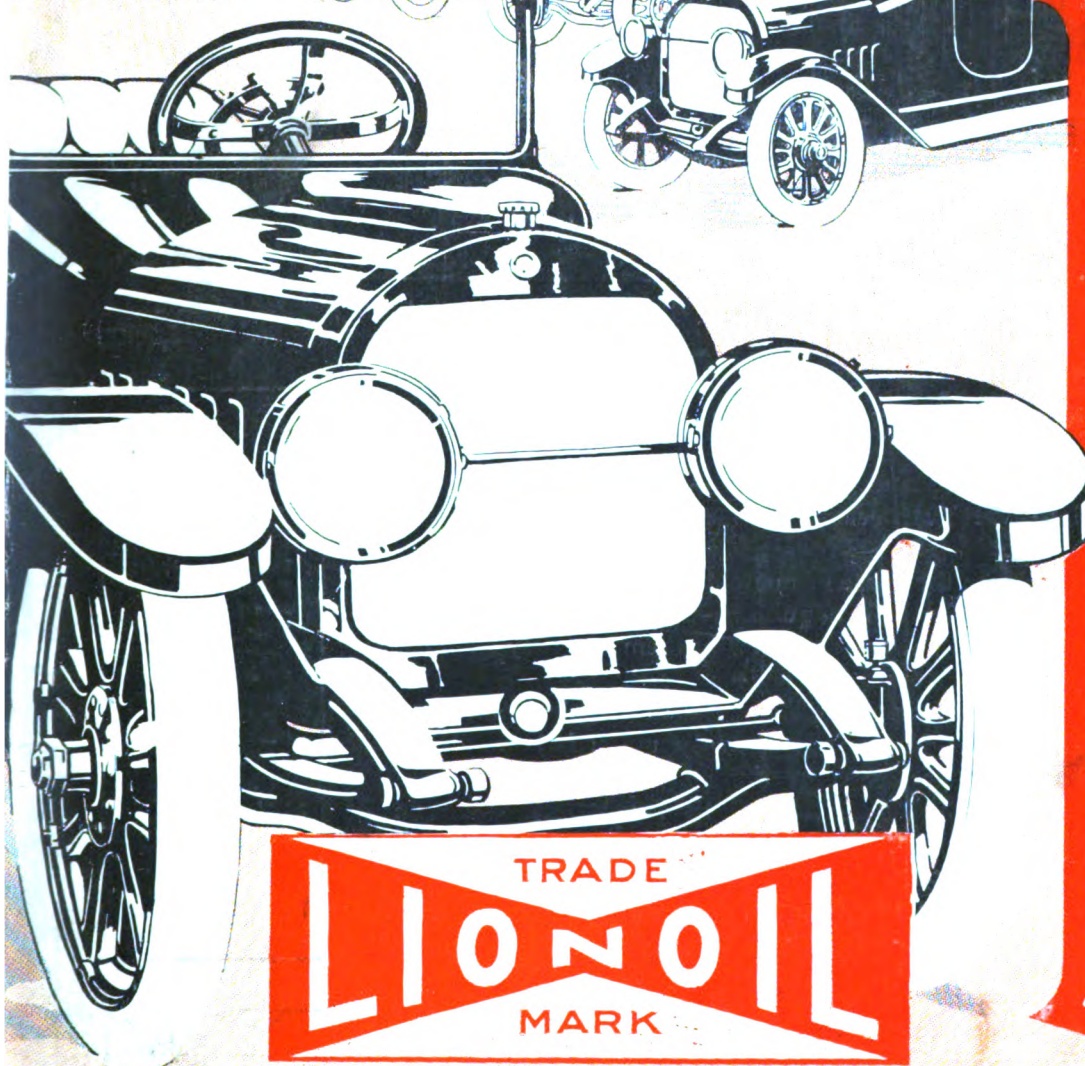


Volume XLII
No. 1

The Dealers' National Weekly
New York January 6, 1915

Ten Cents a Copy
Two Dollars a Year

*The entire output
Rustproofed*



1915

During 1915 the entire output of several big makers of motor cars will be rust-proofed.

The rustproof metal body is a feature that appeals strongly both to dealers and prospective buyers — other things being equal it is often the deciding factor in a sale.

Berry Bros.' Lionoil applied clear or mixed with pigment provides an easy method of rust-proofing any metal body without increasing finishing costs.

May we tell you how?

BERRY BROTHERS
INCORPORATED
World's Largest Varnish Makers
Established 1858

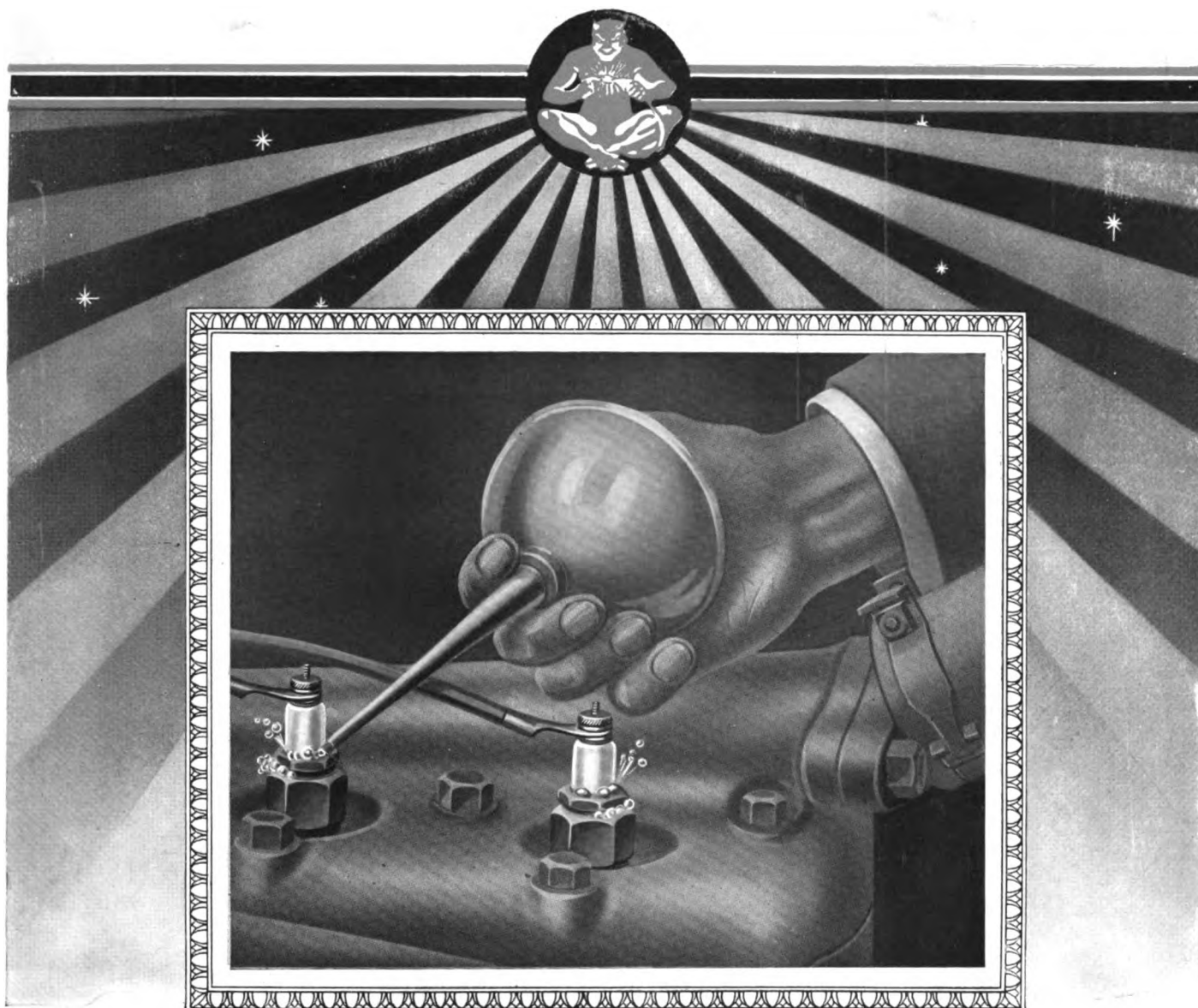
FACTORIES:

Detroit, Mich.
Walkerville, Ont.
San Francisco, Cal.

Branches in principal
cities of the world



The Perfect Rust Preventive



**Well-known Users
of the AC Line**

Apperson
Buick
Cadillac
Chalmers
Chase
Chevrolet
Cole
Commerce
Cartercar
Dodge Bros.
Federal
Ferro
Flint
General Motors
Haynes
Harley-Davidson
Henderson
Hudson
Hupp
Jackson

Try This When Your Motor Is Hot

Nearly all plug manufacturers make this claim: Our plugs do not leak compression—WHY? Because this feature is essential to insure an efficient spark plug.

Plugs that leak are the cause of many defects that are not generally attributed to the spark plugs. Pre-ignition—Inability to throttle down—Engine knocks—Loss of power—are a few of them and they shorten the life of the motor.

We do not know of any plugs made today, aside from the AC-TITAN and CICO, that do not leak when the motor is hot. Make the test pictured above and see for yourself.

AC-TITAN AND CICO PLUGS ARE GAS TIGHT UNDER ALL CONDITIONS

We make only the AC-TITAN-CICO spark plugs. Do not be misled by a similarity of names.

**Well-known Users
of the AC Line**

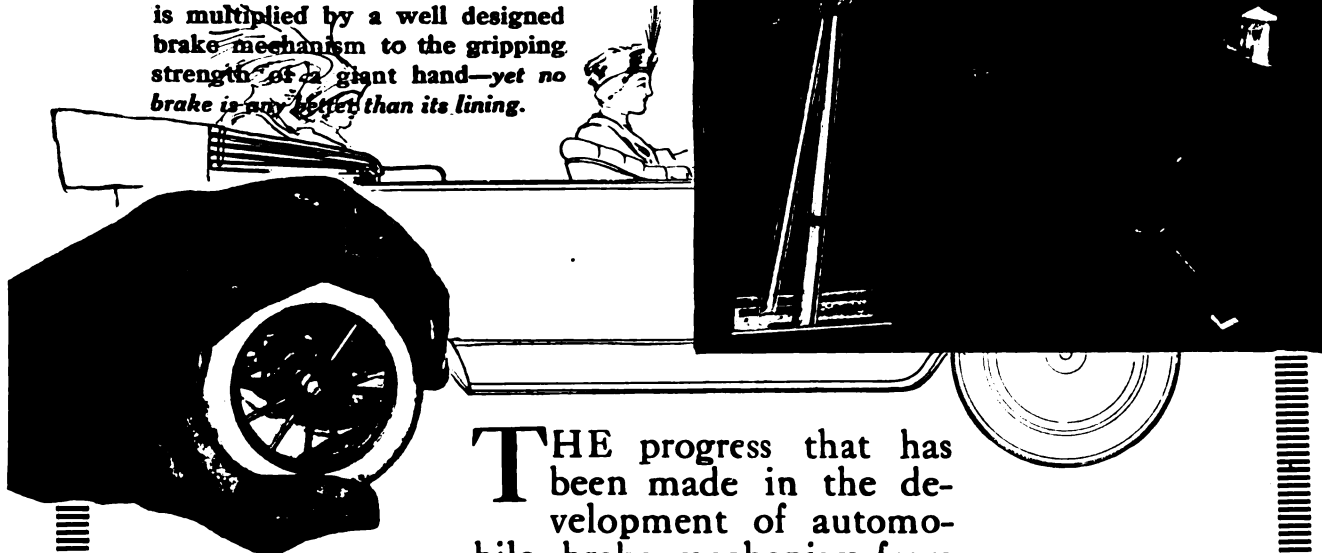
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Lambert
Lexington-Howard
Marathon
McLaughlin
Monroe
Moon
National
Oakland
Olds
Peerless
Pilot
Premier
Pullman
Reo
Saxon
Stearns
Touraine
Velie
Wilcox Truck
1915 AC Packard

CHAMPION IGNITION COMPANY ··· FLINT, MICHIGAN

Raybestos

Has the Grip You Can Trust

Such power as the weakest hand is able to exert on the brake controls is multiplied by a well designed brake mechanism to the gripping strength of a giant hand—yet no brake is any better than its lining.



THE progress that has been made in the development of automobile brake mechanism from the days of the old metal to metal brake finds a parallel in the development of

TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

Making RAYBESTOS as good as it is so that it can be sold at a price competitive with other brake linings is a manufacturing problem that we have solved.

Making RAYBESTOS as efficient as it is, is an engineering problem—the solution of which requires a most intimate knowledge of brakes, their design, operation and principles.

RAYBESTOS is the product of Brake Specialists.

No other concern making brake lining ever has designed or built brakes or brake mechanism. RAYBESTOS actually costs the car owner no more than any other brake lining; service considered, it is the most economical brake lining to buy.

Ask your dealer for the kind with the silver edges—RAYBESTOS—almost every dealer can supply you.

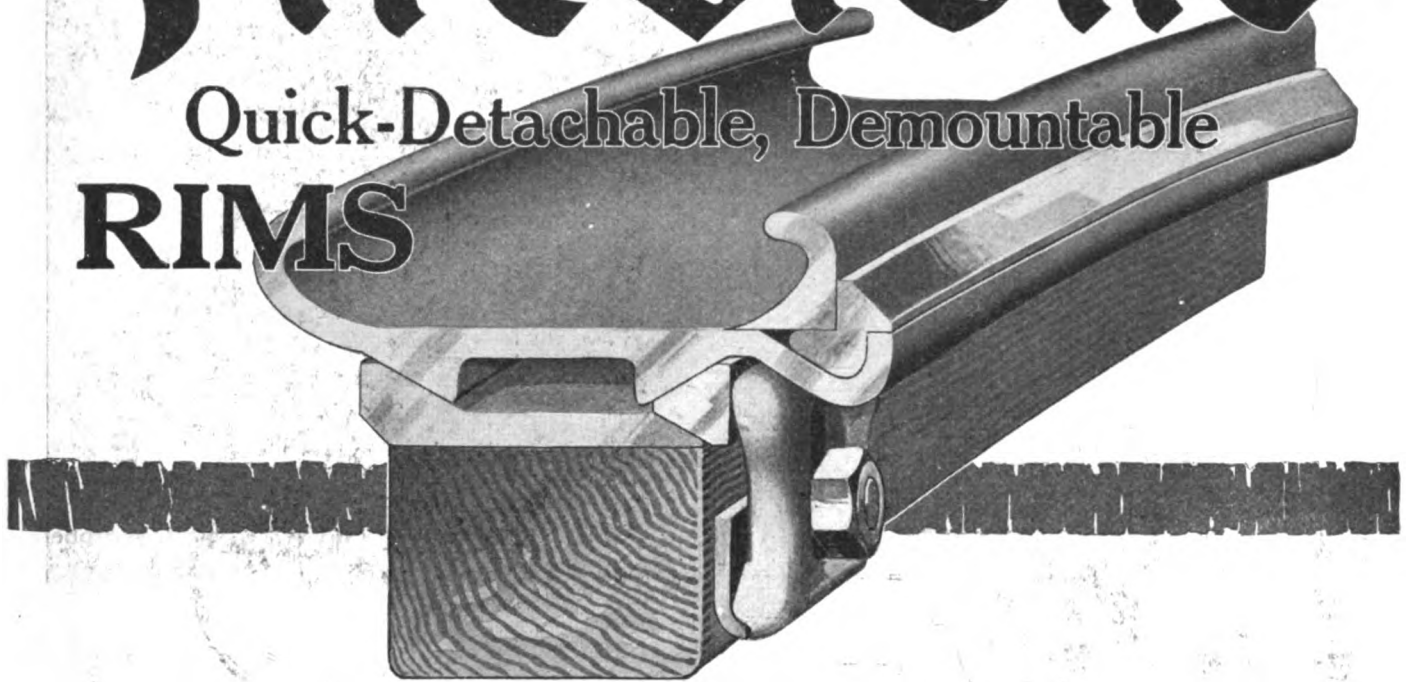
THE ROYAL EQUIPMENT COMPANY 1379 BOSTWICK AVE.
BRIDGEPORT, CONN.

Our Trade Discounts are fixed and we treat everybody exactly alike. No one dealer can get a longer discount than another on RAYBESTOS.



Firestone

Quick-Detachable, Demountable
RIMS



THE production of Firestone Rims last year required 25 million pounds of steel. A train of cars hauling the output would be eight miles long. There are 1,000 distribution stations throughout the United States specializing on Firestone Rim service. And this demand, requiring the output of America's largest exclusive rim factory, has grown—

because—

Car-makers want rims built from the tire-makers' standpoint.

Car-owners want the Firestone quality—lightness with strength, safety with easy handling and convenience.

You want it for all-round efficiency and saving. Equip now.

Firestone Tire & Rubber Co.

"America's Largest Exclusive Tire and Rim Makers"
Akron, Ohio—Branches and Dealers Everywhere



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Most punctures are unnecessary

Every experienced motorist knows that most punctures, so-called, are caused by faulty tubes rather than actual, accidental incision through the tire. Leakage around valves, porous rubber and worn spots are only a few of the unnecessary troubles common to cheap machine-made tubes.

The way to avoid needless punctures is to equip your car with tubes properly *made by hand out of real rubber*. *Kelly-Springfield Tubes* are made that way—and we make them slowly enough and in small enough quantity to *make them right*.

If you are tired of needless tube trouble, try them.

Kelly-Springfield Tires are made the same way. You get the result in increased mileage.

Send for "Documents in Evidence" which tells the experience of others

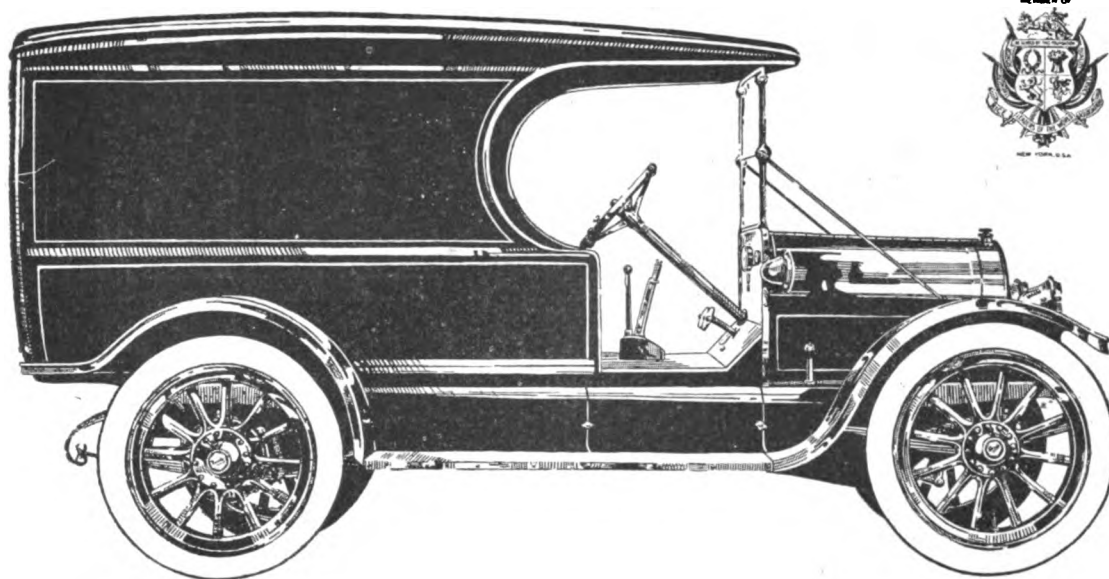
Kelly - Springfield Tire Company

Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.	Atkinson Tire & Supply Co., Jacksonville, Fla.
The Southern Tire & Repair Co., Houston and Beaumont, Texas	Central Rubber & Supply Co., Indianapolis, Ind.
The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.	C. D. Franke & Co., Charleston, S. C.
The Olmsted Co., Inc., Syracuse, N. Y.	K. & S. Auto Tire Co., Limited, Toronto, Ont.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.	Todd Rubber Co., New Haven, Conn.
L. J. Barth, Rochester, N. Y.	Barnard-Michael Tire Co., Buffalo, N. Y.
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\$850

With open body

Equipped with Electric Starting and Lighting System

Overland
DELIVERY CARS

Prices f. o. b. Toledo

\$895

With closed body

Equipped with Electric Starting and Lighting System

It Pays For Itself

Severe winter weather only brings the Overland Delivery Car more prominently into contrast with other delivery mediums. This car does the work of from three to four teams at much less cost. It actually pays for itself in prompt and economical delivery service.

For less than \$900 you get the famous Overland chassis and motor together with two

unit electric self starter, electric lights, 33 x 4 inch tires, highly efficient cooling and oiling systems, special body, and numerous other advantages.

Ignition is by the finest type of high tension magneto.

You will appreciate the many high grade features of the Overland Delivery Car.

Write for our catalogue. Please address Dept. 194.

The Willys-Overland Company, Toledo, Ohio.

DEALERS REGISTER

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, January 6, 1915

No. 1

Dealers Arrive in Force for New York Show

**Fifteenth Annual Exhibit Reveals Much That
Is New—317 Exhibitors**

The Fifteenth Annual Automobile Show, commonly termed the New York show, opened at 2 o'clock Saturday afternoon.

Compared with other shows it stands out in one respect; when the doors opened the show was ready and it opened in reality; as the first visitors entered there was no sweeping out of aisles and none of that appearance of unreadiness which at other times has left a blemish upon motor car exhibitions.

Big First Night

Exhibitors had been told that the doors for the admission of goods would close at noon—and the doors did close at noon. This left two hours for final preparation and its value was apparent.

When the doors were thrown open, a crowd which had been held back, overflowing onto the sidewalk, thronged into Grand Central Palace, and in-

side of an hour the exhibition spaces had as many visitors as other shows have seen after the 8 o'clock opening hour. The afternoon opening made the first day of desirable length.

It is the best show yet staged by the industry, and those who may have prognostigated a decline in this feature of the car trade are destined to receive an awakening when they visit the exhibit.

The total of exhibitors is 317 and of this number 80 are showing cars, 223 accessories and 14 motorcycles. There are two more car exhibitors than last year, 36 fewer accessory exhibitors and one more motorcycle exhibitor. A complete comparison of the 1915 show with the shows of 1914 and 1913 appears elsewhere.

217 Cars Displayed

Counting the cars one by one, there are 221 gasoline pleasure cars, of which 96 are fours, 105 sixes and 7 eights; 124 are touring cars, 48 roadsters, 18 limousines of the conventional type, and the remainder open and enclosed bodies of more or less special design; 15 electrics are shown and 51 chassis are displayed, making a total of 286 cars and chassis. This total in 1914 was 318 and in 1913 325.

The dealer arrangements were somewhat upset at the last minute, but this in no wise affects the plans of the dealers who are visiting the show. It had been planned that





The upper portion of the grand entrance staircase, the link between the Californian garden of the lobby and the Persian interior of the Palace. Studebaker in the left background

the dealer would go to the south side of the fourth floor to exchange his credentials card for a button, but the demand for space by exhibitors crowded this bureau out, and it is located at the right of the main entrance in the same office with the salesmen's and attendants' credential office; it is just outside the gates; there is a sign over the door.

In this office the dealer and attendant card files of the National Automobile Chamber of Commerce are arranged on high, temporary desks, and the dealer who presents his card is checked up on the card file. But one dealer from any dealership company is entitled to a button.

Big Dealer Registration

The opening day there were but few dealers attending; the number did not exceed 300, but the number of attendants was about 2,000. Dealers did not appear in force until Monday and there were still more Tuesday; today there are still more, and the total by the end of the week should be large.

Most of the dealers who attended the first day were from cities and towns near New York. These men were able to reach the show in a comparatively short time and could return the same day. Also, most of them are dealers who are well established with their lines of cars; the men who seek new agencies or are in the market for new cars do not arrive until later. Another reason is that the far-away dealer who attends the first day must spend Sunday, a no-

show day, in New York, when he can do no business.

Manufacturers are planning on augmenting their agency lists before the week is over. This applies especially to the new cars which have but lately made their appearance; among these are the Dodge Bros., Owen, Argo, Monroe, Remington and Dort and Scripps-Booth.

While the location of the exhibits of cars is due to the selections of manufacturers who were given a choice of location based upon production, the arrangement has a peculiar psychological correctness. When one enters the show he

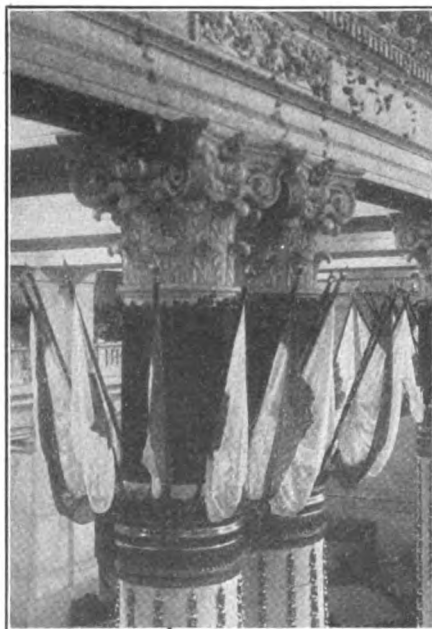
is at once struck by names which are familiar. He does not see an unfamiliar car and have occasion to wonder what it is.

Ascending the entrance stairs there is directly in front of the entrance a long aisle which extends through the main floor. Directly at the head of the stairs on opposite sides of this aisle are the Studebaker and Overland exhibits. Directly back of them are the Maxwell, Buick, Cadillac and Packard, and back of them in the center of the floor are such well-known companies as Reo, Chalmers, Paige, Locomobile, Hupmobile, Hudson, Regal and Kissel. Others equally well known have the spaces along the walls.

Five Electric Makes

The second floor, about one-third of which is taken up by a large well in the center, is devoted entirely to cars, with five electrics occupying a principal position; they are, Rauch & Lang, Ohio. Anderson, Baker and Waverley. On the third floor are many small cars of the type which has lately made its bid for popularity, among them being the Scripps-Booth, Remington, Argo, Twombly and Gadabout. Accessories occupy the major portion of this floor and all the fourth floor except the spaces occupied by the motorcycles and two cars, the Crawford and Malcolm.

At the right of the main entrance inside the ticket gates is a cloakroom and restaurant and at the left another cloakroom and telephone booths. The press



Gaily colored flags adorn the tops of the lofty pillars among the cars

room is in the northwest corner of the fourth floor. Restaurants are located in the northwest corner of both the third and fourth floors.

Manager Samuel A. Miles, as usual, is receiving congratulations on the appearance of the show building. The entrance has been transformed into a Californian garden with a pergola, while the whole interior of the structure is modeled after a Persian garden. The names of exhibitors are in illuminated glass signs, which hang above and at the back of the spaces. At first, they do not seem to be very conspicuous, but after one has become accustomed to looking at them and learns where to find them the plan is simple enough.

Eight-Cylinder Cars Draw

One of the principal points of interest is, of course, the new eight-cylinder cars, this being the first time they have been displayed in an American show. They are the Cadillac, King, Briggs-Detroit and Remington. Many of the show visitors apparently expect the eight to be conspicuous because of its size. A visitor to the Briggs-Detroit exhibit looked it all over and asked a salesman where the eight was; he seemed surprised when it was pointed out to him and immediately proceeded to inspect it with considerable curiosity.

The new small sixes are also objects of much interest.

There are two price changes; the Paige four has been reduced from \$1,195 to \$1,075 and the Chalmers light six from \$1,850 to \$1,650. The Kissel 6-42, the price of which was not stated prior to the show, is \$1,650 and \$2,000 with a detachable top. The Oakland has a new brougham at \$2,500.

In accessories the price tendency is if anything downward and this is especially true in regard to the numerous shock absorbers built for Ford cars. These devices are becoming more numerous and competition is keen. A new Golde one-man top for a runabout is shown.

Polished Chassis Attract

Throughout the car part of the show the one thing which universally seems to attract attention is the polished stripped chassis. New bodies and original designs draw their share of attention, but every one of the many chassis exhibits which display the mechanical part of the car is always surrounded by an interested crowd. In many cases the exhibitor has placed a lecturer at the chassis and his story always proves a drawing card.

In body construction there is evidence

that manufacturers believed the public possesses confidence in mechanical design and is interested mostly in bodies and exteriors. A number of body refinements stand out distinctively.

One of these is the boat body wherein the upper line of the side curves downward and the sides flare outward. Chair seats such as displayed in the National salon touring car are popular. Another type is the corridor body, in which there is a division of the front seat with sufficient room between for the passenger

to pass. Adjustable seats, which are provided in the Maxwell and Lexington and others give the owner the advantages of a built-to-order body. There is also a tendency to make spare seats less conspicuous, many of them folding out of the way and nearly out of sight.

Increasing Buyer's Comfort

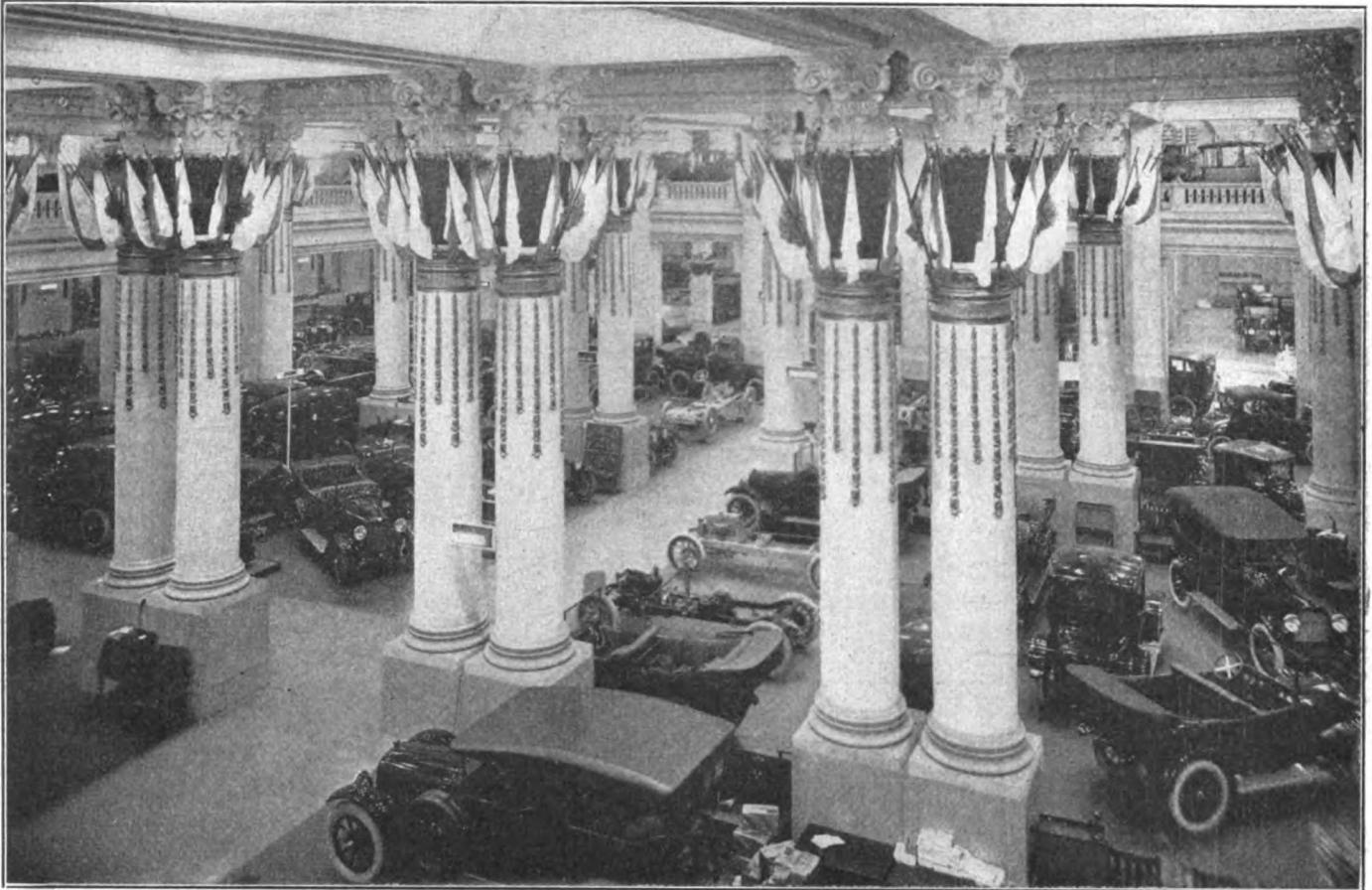
The steering wheel which may be thrown up out of the way when entering the car is another feature whose object is convenience, and the disposal of im-

STATISTICAL PICTURE OF NEW YORK SHOW

	Garden and Palace 1913	Grand Central Palace 1914	Grand Central Palace 1915
Total Exhibitors	424	349	317
Car Exhibitors	89	78	80
Accessory Exhibitors	320	259	223
Motorcycle Exhibitors	15	12	14
GASOLINE CARS			
Two-cylinder	0	2	0
Four-cylinder	169	132	96
Four-cylinder (piston valve)	0	1	0
Four-cylinder (sleeve valve)	6	8	10
Six-cylinder	86	98	105
Six-cylinder (sleeve valve)	4	2	1
Six-cylinder (crescent valve)	0	0	2
Six-cylinder (rotary valve)	1	1	6
Eight-cylinder	0	0	7
Total Gasoline Pleasure Cars	266	264	221
Touring Cars	162	143	124
Roadster	49	50	48
Limousine	23	15	18
Berline	8	6	2
Coupe	19*	17	7
Phaeton	1	2	1
Landulet	0	1	1
Raceabout	2	2	3
Sedan	0	14	8**
Cabriolet	0	5	4
Brougham	0	0	4
Total	266	264	221
Air Cooled Cars	5	6	3
Water Cooled Cars	261	258	217
Total	266	264	221
CHASSIS			
Four-cylinder	27	21	20
Four-cylinder (sleeve valve)	0	0	0
Six-cylinder	21	15	26
Eight-cylinder	0	0	1
Electric	1	1	0
Total	49	37	51
ELECTRIC CARS			
Coupe	7	2	1
Cabriolet	0	0	1
Roadster	3	1	3
Brougham	0	13	9
Town Car	0	1	0
Limousine	0	0	1
Total	10	17	15
Special Exhibits—			
Racing Cars	1	0	0
Grand Total Cars and Chassis	325	318	286

* Includes Cabriolets.

** Includes Two Touring Models with Detachable Tops.



Looking down through the foliage which surrounds the well in the second floor. The Palace has never looked prettier than it does this year

pedimenta is met by the installation in some cases of compartments which are almost miniature clothes presses. Arm rests and other little comfort features are found in many of the cars.

In some of the roadsters provision has been made for a third passenger by cutting away the center of the conventional seat and placing a third seat in the center and further back. In nearly every case the tire carrier has been removed from the runningboard and is now located at the rear of the car, or the tire has been placed in a compartment somewhere inside the body.

"Show" Cars Are Few

In enclosed cars the chief development is in smoother lines of the superstructure. Curved windows are employed in numerous instances and the streamline effect is sought generally.

At every show there are always certain of the exhibited cars which stand out in the recollection of the visitor because of their striking appearance or unusual body construction. Many of these are built solely for show purposes while others have been incorporated in the regular line of the manufacturer. One of the oddest-looking vehicles by far is what the Cole company terms a Cubist roadster. In this, all the lines are straight

and angular and the rear construction is box-like. Auxiliary side seats pull out from beneath the regular seat, permitting one passenger to sit over the running-board on each side. Another odd creation is the little Gadabout roadster, which has a wicker body. A Fischer touring car has a top which drops down into the body and the Owen magnetic transmission car presents a speedster of similar design.

Plenty of Bright Colors

The custom body department of the Locomobile New York branch is responsible for a touring limousine and a brougham, the latter of which is built on the lines of an old-style horse-drawn coach. Many colors characterize the Packard exhibit and the Pierce-Arrow has an olive green coupe.

The National salon touring, with its sliding chair arrangement, while unusual is a stock model. In the Cunningham space are an open-front limousine with mulberry colored upholstery and a run-about body in gun-metal finish with an ivory stripe. The Cunningham company has had years of experience in body building and the construction and finish of both these types is original.

The whole Oakland exhibit is strikingly foreign throughout and the Mercer

display presents a line of bodies of unusual and distinctive design and finish. A big yellow Lewis sedan has a skylight let in the roof, and the Lexington exhibit includes a gray roadster with adjustable seats. One of the McFarlan touring models is done in brown with Spanish leather. Inquiry regarding the broad runningboard of one of the Oaklands elicited from General Sales Manager Warner the explanation that the runningboard on each side is a trunk rack and that on his touring trips he always manages to stow at least four suit cases in these positions.

Practically every manufacturer has a convertible body of some sort in either two-passenger or touring form.

Motion Displays Popular

Of the many attempts to catch the eye of the dealer none succeed better than those which incorporate some motion element in the display. Stationary objects, with a few exceptions, do not awaken the response accorded to the moving devices.

One of the most elaborate and effective is employed by the Waltham Watch Co., which has a miniature locomotive and tender, built upon actual locomotive blueprint specifications on a scale of 1 inch to 1 foot. Attached to one

side-rod is a vertical rod which slides through an attachment on the running board. At the top of the rod is a Waltham motor car timepiece, and when the engine is actuated by compressed air the wheels turn at 190 r. p. m. and the timepiece is jumped about.

Waltham's Air Locomotive

The air is compressed by a motor and 6-pound pressure pump under the exhibit table. The driving wheels of the locomotive are elevated just out of contact with the rails. The locomotive is numbered 645, the number of a Waltham railroad timepiece.

The mechanism is perfect in detail, was built in the Waltham shops and cost between \$1,500 and \$2,000.

The Stewart-Warner demonstration of its vacuum feed is another popular display; above a gasoline motor is fixed a small glass jar, constructed upon the principle of the vacuum feed. The motor is mechanically operated and the flow and check of the system is apparent. A capable salesman explains continuously.

A non-motion device which, however, gets its share of attention, is the suspension of 156 pounds of iron weights by means of an inch-wide section of Voorhees Ideal tube. The tube is stretched until it is a couple of feet long, and anyone who doubts the accuracy of

the weight figures on the placard is requested to lift them and see for himself. Handles are conveniently attached for this purpose.

The Brown Co. has two of its B'co spark plug pumps in section operating on a counter, and the S. & S. Co. has a device whereon the curious visitor may test out its no-back-kick crank.

There are shock absorber motion displays in plenty; in fact, this is the shock absorber man's favorite way of demonstrating his device. Many of them, such as the Hartford and Sager, have wheel devices, while others have hand-operated and mechanically-operated jump-and-jerk or jump-and-no-jerk affairs.

Oil Gusher Exhibit

The Platt & Washburn Refining Co. has added a touch of realism to its booth by placing at the four corners miniature oil well gushers, those tall, wooden towers which stick up everywhere in the oil country.

The Dann Oil Cushion Spring Insert in glass form, with the inserts visible in their actual position in the spring, is an effective demonstration.

For show purposes the Champion Ignition Co. has cut up brass lighting fixtures and produced attractive individual display stands for its plugs. They would be advantageous in any store.

The Stromberg carbureter is shown in an unusual manner. In a large board covered with green velvet are three 10-inch holes, covered with glass. Behind the glass are sectional carbureters over which is thrown a green light. The display draws added attention to this product in a certain manner.

Many New Agencies

The Jackson is represented in New York by a new company, the Shaw-Pearson Motor Corporation, which is also handling the exhibit at the show. This new agency company is headed by Oscar F. Shaw, Jr., president and treasurer, who formerly was engaged in the general contracting business. The vice-president and secretary is James E. Pearson, formerly connected with the Jackson agency in the metropolis. This company's territory extends over part of Connecticut and south part way through Maryland.

The Imperial also appears in new hands, being handled by Paul Lacroix, who is an importer of foreign cars, but states that this branch of business has been very slight since the European war began. Lacroix has secured the Imperial distribution in a large section surrounding the metropolis and has established these agencies: Redbank, N. J., R. Boyce; Nyack, A. W. Grote; Newburg, John Dubois.

Dealers Registration Grows Steadily Toward New Record

Some of Those Who Had Registered Up To Tuesday Night

CAR DEALERS

Buffalo—Oakland—Frederick Eaton, manager of the Oakland Distributing Co.

Atlanta, Ga.—Oakland—George W. Hanson, manager of the Oakland Motor Sales Co.

Richmond, Va.—Stutz—C. K. White, of George C. White & Son.

Cleveland—Mercer—G. L. Sitgreaves, manager of the Mercer Motor Sales Co.

Chicago—Mercer—E. W. Schillo and Leonard Lorimer, of the Schillo Motor Sales Co.

Boston—Mercer—Fred. S. Smith.

Philadelphia—Mercer—Paul and William Oliver, Mercer Co. of Philadelphia.

Baltimore—Mercer—Clyde Loose, manager of the Club Garage.

Bridgeport—Mercer—E. M. Jennings and M. Cornwell.

Providence—Mercer—Harold Adams and Ralph Knight, of the Adams & Knight Co.

Buffalo—Mercer—G. W. Swan.

Philadelphia—Dodge Bros.—S. S. Thornton, of the Thornton-Fuller Co.

Buffalo—Saxon—A. Roppenberg, of the Mutual Motor Car Co.

Boston—Chandler—Ralph Neddleton, manager and George Crittenden, assistant manager of the Back Bay Sales Co.

Philadelphia—Chandler—W. P. Herbert, Chandler Sales Co. of Philadelphia. Herbert is also president of the dealers' association in that city.

Rochester—Chandler—H. G. Strong, of the Strong-Crittenden Co.

Kansas City—Detroit—W. T. Scarritt, of the White Motors Co.

Boston—Twombly—R. Ross Maddox, of the H. Ross Maddox Co.

San Juan, Porto Rico—Twombly—S. W. Lipsett.

Philadelphia—Twombly—W. A. Stover and L. S. Hannold, of the Stover-Hannold Co.

Boston—Chevrolet—C. J. Vincent, branch manager.

Philadelphia—Chevrolet—G. R. Wright, branch manager.

Rochester, N. Y.—Lexington—Curtiss B. Lyons, of the Pritchard-Lyons Motor Corp.

Rochester, N. Y.—Pilot—L. L. Horton and E. C. Almy, of the Almy Motor Co.

Providence—Pilot—Richard Bradford.

Troy—Pilot—John J. O'Hara.

Pittsburgh—Pierce-Arrow—Robert McCurdy, of the McCurdy-May Co.

New Haven—Pierce-Arrow—George P. Westfeld.

Cleveland—Packard—C. A. Forster, of the Packard Cleveland Co.

Bridgeport—Regal—Harry S. Martin.

Rochester—Ford—T. J. Northway.

Syracuse—Overland—John Lee.

Syracuse—Cadillac—George W. Norris.

Syracuse—Velic—W. R. Mason.

Syracuse—Overland—F. J. Brown and J. E. Bristol.

Syracuse—Packard—F. L. Stowell.

Syracuse—Winton—Frank R. Stockbridge.

Syracuse—Maxwell—Wright Gillies, district manager.

Utica—Pierce-Arrow—A. A. Ledderman.

Saranac Lake, N. Y.—Franklin—E. L. Gray.

Newburgh, N. Y.—Franklin—George Mason.

Syracuse—Chalmers—E. G. Hanna and D. W. Slocum.

Buffalo—Overland—Fred L. Eaton.

Buffalo—Hudson—E. G. Oliver.

Allentown, Pa.—Chalmers—A. J. Lawfer, Lawfer Automobile Co.

Troy—Stutz, Premier, Apperson—Leonard Aird, Aird Motor Co.

Amsterdam, N. Y.—Mitchell, Marmon, Cadillac, Reo, Ford—George Merriam, Merriam Motor Car Co.

Rochester—Premier, Maxwell, Lyons-Atlas—A. M. Zimbrich, United States Garage.

Schenectady, N. Y.—Case, Cole, Oakland, Overland—H. W. Chubb.

Bridgeport—Hudson—Erwin M. Jennings, Erwin M. Jennings Co.

Waterbury—Cadillac—R. C. Fields.

Waterbury—J. S. Turrell, Turrell's Garage.

Hartford—Peerless, Hudson, Brock—George D. Knox.

Albany—J. B. Bleecker.

Hudson, N. Y.—W. P. Woodward.

Hartford—Cadillac—Messrs. Rose and Ledger, Brown, Thomson & Co.

Utica—J. W. Seaton.

Binghamton—E. J. Weeks.

Albany—M. L. Blackman.

Jamaica, N. Y.—Cadillac, Case, Ford—Louis Disbrow, racing driver; Disbrow Bros. Garage.
Albany—J. F. Wright.
Albany—R. F. Riffe.
Buffalo—Charles Hoffman.
Oneonta, N. Y.—Arthur Butts.
Buffalo—R. M. Ware.
Cleveland—Baker Electric—F. R. White, V. Pres. & Gen. Mgr.; E. Gruenfeldt, Eng.; George H. Kelly, Secy. & Sales Mgr.
Cleveland—White—Windsor White, Pres.; Walter C. White, V. Pres.; J. Harris, Adv. Mgr.; Leo. Melanowski, Mechanical Designer; Mr. Hulett, Gen. Supt.
Detroit—Packard—Henry B. Joy, Pres.
Kokomo—Apperson—Elmer Apperson, J. B. Eccleston, J. M. Newmark.
Auburn, Ind.—Auburn—Morris Eckhart, J. I. Farley, M. E. Garrett.
Kokomo—Haynes—A. G. Seiberling, Robt. Crawford, Frank N. Nutt.
Indianapolis—Herff-Brooks—H. H. Brooks.
Muncie—Inter-State—B. W. Twyman.
Hartford, Wis.—Kissel—S. H. Kissel, C. H. McCansland.
Indianapolis—Lyons-Knight—Harry Knox.
Connersville, Ind.—McFarlan—H. H. McFarlan.
East Moline, Ill.—Moline—W. H. Van Dervoort, C. H. Van Dervoort.
Indianapolis—Pathfinder—W. K. Bromley, L. E. Willson.
Indianapolis—National—W. Guy Wall, F. S. Clark, L. S. French.
Indianapolis—Premier—F. E. Smith, Walter Bieling.
Indianapolis—Stutz—H. W. Anderson.
Moline, Ill.—Velie—R. R. Bush, Geo. H. Lloyd, H. T. Wheelock, Lee Hagard.
Cincinnati—United States motor truck—Nelson S. Gotshall, Sales Mgr.
Chicago—Overland—B. D. Zimmerman.
Los Angeles—Packard—E. C. Anthony.
Poughkeepsie—Ford—John Van Benschooten.
Buffalo—Mitchell—J. J. Gibson.
Philadelphia—Mitchell—R. D. Weiland, Ward J. Keller.
Cleveland—Peerless—Chas. Kittridge, Pres.; R. J. Schmunk, Gen. Sales Mgr.; Strickland, Eng., Twitmeyer, Adv. Mgr.; R. W. Cook, Gen. Mgr., Philadelphia; E. W. Burnshaw, Jr., Sales Mgr.; C. T. Silver, New York Agent.
St. Johnsbury, Vt.—Hudson—W. A. Wright, dealer.
Cleveland—Rauch & Lang Carriage Co.—C. L. Wieber, Gen. Mgr. & Pres.; E. J. Lang, Treas.; W. G. Panwast, Sales Mgr.; D. C. Coolingham, Eng.; J. R. Hertner, Eng.; C. L. Wieber, Jr., Asst. to Gen. Mgr.; H. R. Beikenbach, N. J. Distr.
Cleveland—Chandler—F. C. Chandler, Pres.; C. A. Emise, V. Pres. & Sales Mgr.; W. S. Mead, 2nd V. Pres. & Foreign Rep.; S. Regan, Treas.; G. V. Whitlock, Chf. Engr.; C. A. Carey, Purch. Agent; J. R. Winterson, District Engr.; H. L. Hubbard, District Engr. Distributors, W. P. Herbert, Philadelphia; R. B. Nettleton, Boston; H. G. Strong, Rochester; A. Poehlman, Baltimore.
Toledo—Overland—J. W. Willys, Pres.; C. S. Jamison, V. Pres.; H. B. Harper, Sales Mgr.; W. B. Sawyer, R. J. Lockwood, H. C. Fitch, H. W. Little, L. W. Johnson, T. O'Brien, A. J. Keller, J. L. Bender, A. A. Franklin, C. Hanson, R. M. Robertson, W. C. Hodge, J. A. Roberts, A. C. Addison, J. David, F. S. Andrews, Geo. W. Floyd.
Cleveland—Winton—Alexander Winton; C. W. Churchill, Gen. Mgr.; C. W. Mears, Adv. Mgr.; Harold B. Anderson, Eng.; W. H. Doddridge, Service Mgr.; O. F. Baughman, Traffic Mgr.

SUPPLY DEALERS

Toledo—Champion Spark Plug Co.—R. A. Stranahan, Pres.; F. B. Caswell, Sales Mgr.; E. S. Torrance, New England Rep.; Geo. French, Jr., Pennsylvania; Chas. L. Corwin, New York Rep.
Cleveland—The National Screw & Tack Co.—H. G. Alexander, Treas.; W. S. Funlan, E. A. Derby.
Cincinnati—Perkins Campbell Co.—M. D. Campbell, Mgr.; J. P. Mills, J. W. Crider, New York Mgr.; J. Lack, Local Rep.; C. W. Stricker.

Cleveland—The Globe Machine & Stamping Co.—R. B. Dangelers, Sales Mgr.; J. F. Soodnich, Rep.; W. A. Sternberg, Rep.
Hartford, Conn.—W. F. Keene, M. Brickner.
Toledo—The Bock Bearing Co.—Carl Clement.
Rochester—J. H. Sager Co.—C. J. Ivens.
Horseheads, N. Y.—E. F. Crane, Fred. Castle.
Detroit—Timken Axle Co.—George L. Bitting.
C. E. Gordon, H. J. Porter, E. B. Lozier, W. R. Timken, Pres.; H. W. Alden, Engr.; E. W. Lewis, Heman Ely, F. C. Gilbert, F. A. Sim, F. A. Osborne.
Cleveland—General Rim Co.—R. W. Ashley, Mr. Moyer, Eng.; F. Oberkirch, Pres.; A. M. Stewart, C. A. Gardner, J. G. Ahrens.
Dayton—Dayton Malleable Iron Co.—G. J. Loomis, F. W. Kolb.
Cleveland—Standard Welding Co.—F. C. Manternach, Gen. Mgr.; F. S. Bryant, H. A. Flagg, F. S. Stergel, S. W. Hartley, Sales Mgr.
Elyria, O.—Garford Mfg. Co.—A. G. Bean, Gen. Mgr.; R. H. Manson, A. M. Allen, Mgr. Access.; J. Gross, W. H. Scott, A. B. Smith, A. Davis, Geo. Howard.
Cleveland—The Perfection Spring Co.—Christian Girl, Pres.; John B. Hull, V. Pres.; P. A. Connolly, Secy.; Ernest Farr, Treas. Salesmen, W. E. Culver, C. W. Hatch, E. F. Bunker, East. Rep. Engineers, H. E. Figgie, John Utz, C. E. Clemms, T. J. Fay, M. M. McIntyre, Supt.
Cleveland—Forest City Elec. Co.—W. B. Cleveland, Pres.; G. A. Harwood, Sales Mgr.; T. A. Westman; Carl Van Sciever, E. M. Coc; J. A. Cadle.
Cleveland—Gabriel Horn Co.—C. H. Foster, G. Potter, H. Benjamin, H. S. Penney.
St. Louis—McQuay-Norris Mfg. Co.—L. E. McQuay, V. Pres.; E. H. Hill, Secy. & Treas.; A. J. Mummer, Eng.; H. P. Marsh, N. Y. Mgr.; W. K. Norris, L. E. Hill.
Cleveland—The Cleveland Worm Gear Co.—D. Fitzpatrick, V. Pres.; F. M. Gregg, Pres.; C. J. Fitzpatrick, Eng. & Sales Mgr.; C. W. Fitzpatrick.
Canton—Gordon Rubber Co.—Gordon, Pres.
New York—Ireland Rubber Co.—R. S. Ireland.
Cleveland—Kemco Elec. Co.—C. F. Miller, Secy. & Treas.; H. K. Kenyonian, Pres.; Robt. Williams, Sales Mgr.; Distributors, E. J. Edwards, T. P. Meinhard, F. C. Fealey, B. Wildermuth.
Pittsburgh—Pittsburgh Model Engine Co.—W. J. Strausburger, Pres.; L. A. Myers, V. Pres.; M. P. Boon, Sales Mgr.; Mr. Webb, Salesman; R. H. Severson, Engr.
Toledo—The Toledo Auto Tool Co.—C. A. Attwood, V. Pres.; L. M. Rakestraw.
Cleveland—Leece-Neville Co.—Geo. S. Cole, Gen. Mgr.; B. M. Leece, V. Pres.; Arthur A. Skinner, Sales Mgr.; H. C. Branch, Asst. Eng.
Cleveland—Willard Storage Battery Co.—T. A. Willard, Pres.; R. C. Norberg, Asst. Gen. Eng.; F. S. Gassaway, Branch Mgr.; M. G. Hillman, Branch Mgr.; F. D. Dobin, R. J. Nightingale, Mgr. Automobile Sales; H. S. Bebbly, Mgr. of Agencies; H. S. Gardner, Branch Mgr.; S. S. Jenkins, Branch Mgr.; Louis Sears.
Cleveland—Brown Trafilog Co.—P. J. Dasey, Sales Director; W. H. Brown, Gen. Mgr.
Youngstown, O.—Republic Rubber Co.—John Kelley, Sales Mgr.; Webb Brown, Adv. Mgr.
Chicago—Excelsior General Supply Co.—F. W. Grubt.
Philadelphia—Mfg. Supply Co.—Mr. Wigmore.
Des Moines—Herring Auto Supply Co.—Mr. Bradt.
Omaha—Powell Auto Supply Co.—Mr. Chambers.
Philadelphia—J. H. McCullough & Son—Mr. Fisher, Buyer.
Boston—Lawton-Wetmore—Mr. Savage.
Reading—Central Motor Car Co.—H. R. Schwartz.
Toledo—Champion Spark Plug Co.—Mr. Butcher, Eng.
Dayton—Dayton Airless Tire Co.—Mr. MacMillan, V. Pres.; E. R. DeTamble, N. Y. Mgr.
New York—The Marathon Tire Sales Co.—Owen Moynihan, Sales Mgr.; M. M. Fancher,

Asst. Sales Mgr.; Howard F. Smith, Factory Sales Mgr.
Cleveland—The West Steel Casting Co.—Ralph H. West, Gen. Mgr.; Thos. D. West, Chairman.
New York—Platt & Washburn Refining Co.—H. J. Guthrie, Pres.; B. D. Benson, V. Pres.; P. N. Miller, Treas.; G. S. Richards, Secy.; W. S. Reynolds, Syracuse Mgr.; Neil Burgess, Boston Manager; H. S. Bacon, Philadelphia Mgr.; W. J. Schatz, Eng.; C. W. Stratford, Eng.; J. M. Stockisch, Pacific Coast Mgr.; J. R. Bacon, Philadelphia Lubrication Mgr.; J. E. Matthews, New York; C. A. Haager, New York; E. J. Inge, Boston; R. A. Ludlow, Boston; H. R. Butler, Springfield; H. A. Butler, Portland; E. J. Beede, Boston; S. S. Holt, Boston; Geo. Brennan, Providence; D. H. Pierce, Boston; W. A. Beach, Bridgeport; H. A. Parsons, New York City; F. J. Cusack, New York City; Geo. Shortmeier, New York City; A. P. Ross, New York City; H. C. Graham, New York City; J. Schreyer, Spec. Rep.; F. C. Braden, Long Island; W. H. Reese, New Jersey & Pennsylvania; F. H. Dickison, Philadelphia; F. H. Tucker, Albany; S. Whitney, Boston; J. F. Whitney, Boston; Wm. Crelin, Newark; Sam. Wigney, Los Angeles.
George Stowe, New York; James Levy, Chicago; Charles Chalmers, Philadelphia; Isaac F. Marcosson, New York, writer; Hugh Chalmers, Pres. of Chalmers company; John C. Hammond, New York; Lee E. Olwell, Gen. Mgr.; F. L. Caulkins, Middletown, Conn.; F. W. Piper, Brooklyn.
E. H. Cox, Brooklyn; C. H. Fischer, Cincinnati; Philip C. Baer, New York; Fred Scaiola, New York; Lee Counselman, Norfolk, Va.; Christian Moller; Roberto Hernandez, New York; J. H. Seguin, New York.
A. L. Rogers, Pittsfield, Mass.; A. A. Mills, Pittsfield, Mass.; Fred L. Mason, Yonkers, N. Y.; S. E. O. Plinger, Newark; L. W. Franklin, Danville, Va.; Joseph W. Ball, New York; Paul D. Sheahan, New York.
G. P. Switzer, New York; Jule Keen, Malvern, L. I.; Herbert Rose, Yonkers, N. Y.; Ralph W. Barnes, Bridgeport, Conn.; Charles B. Simonds, New York; Henry L. Klein, New York.
Milwaukee—Cutler Hammer Mfg. Co.—A. R. Cosgrove, W. A. McCarrell.
Auburn—Double Fabric Tire Co.—Linn Murray, W. H. Willenar.
Kokomo—Kokomo Electric Co.—J. P. Grace, Paul J. Chapman, C. T. Byrne.
Chicago—Service Motor Supply Co.—Samuel H. Silverman, Secy. & Treas.
New Orleans—Inter-State Electric Co.—Mr. Levey, Sales Mgr.
Wampum, Wis.—Shaler Co.—R. B. Dunlap, Sales Mgr.
Muncie—Warner Gear Co.—Ray P. Johnson, H. J. Garcear, E. B. Baltzly.
Kansas City—Western Tire & Rubber Co.—W. O'Neill, Messrs. Martin & Goldberg.
Indianapolis—Wheeler & Schebler—Geo. Briggs.
St. Louis—Wagner Electric Mfg. Co., Walter Robbins, Asst. Mgr.
Marion—Rutenber Motor Co.—G. W. Bowen, Pres.; R. A. Vail, Eng.
Milwaukee—Federal Rubber Mfg. Co.—B. C. Dowse, Pres.; H. A. Githens, V. Pres.
Albany—Cox Brass Mfg. Co.—Wm. G. Cox, T. M. Cox, Wm. M. Cox, Jr.; W. D. Eames, Ed. Reilley, Jos. Charlome.
Buffalo—Manzel Bros. Co.—H. J. Manzel, R. C. Renner.
Jes Moines—Herring Motor Car Co.—George Bradt.
Newburgh—Youngs & Co.—Mr. Young.
Detroit—Carl M. Green Co.—C. M. Steele.
Syracuse—Brown Co.—G. H. Brown, H. W. Brown, C. J. Hall, M. Rosen.
Lynn, Mass.—Ruth Hartwell Co.—Seymour Ruth, Irving J. Hartwell.
Oakley, N. J.—Haines & Hollingshead.
Seattle—Washington Auto Supply—W. Woods.
Paterson, N. J.—H. Lund Smith.
Portland—Maine Motor Car Co.—H. W. Tupper.
Poughkeepsie—Warm Hand Steering Wheel Corp.—Grant E. Smith, Harold D. Smith.
Reading—F. R. Althous.

Chalmers Dealers Look for Good Year

Optimism Rampant at Get-together Meeting—President Chalmers' Talk Starts the Boosting

San Francisco—Weinstock-Nichols Co., A. D. Nichols and W. M. Weinstock.

Pittsburgh—E. Webb, Joseph Woodwell Co.

San Francisco—Harry Aujur, buyer for Chanslor & Lyon Co.

Chicago—Samuel G. Silverman, Service Motor Supply Co.

Indianapolis—Lon R. Smith, Eisemann Magneto Co.

Detroit—Fritz Neff, Eisemann Magneto Co.

Syracuse—F. H. Humpage, Dyneto Electric Co.

Springfield, O.—"Duke" Hutchinson, Kelly-Springfield Motor Truck Co.

Detroit—Lee Anderson, Hupmobile advertising manager.

Detroit—Roy Buell, special representative.

Detroit—Frederick Wages, Regal assistant sales manager.

Chicago—F. L. Estey, Chicago Examiner.

Detroit—K. C. Clark, special representative.

Chicago—George H. Bryant, Williams & Cunningham advertising agency.

Chicago—J. D. Fulton, Chicago Herald.

Chicago—H. C. King, Chicago Herald.

Detroit—Lee M. Olwell, Chalmers sales manager.

Detroit—Ralph Estep.

Buffalo—George W. Houk, Houk wire wheels.

Chicopee Falls, Mass.—"Ned" Broadwell, Fisk Rubber Co.

Detroit—C. M. Hall.

Cincinnati—L. M. Gotschall.

Syracuse—H. W. Chapin, Samuel H. Cook and Thomas Wetzel, Brown-Lipe-Chapin Co.

Detroit—L. D. Bolton, Brown-Lipe-Chapin Co.

Milwaukee—A. R. Cosgrove, general manager Cutler-Hammer Mfg. Co.

Rutherford, N. J.—Harry Braender, Braender Rubber & Tire Co.

Syracuse—William T. Muehl, M. & S. Gear Co.

Kansas City—Louis H. Scurlock, M. & S. Gear Co.

Chicago—Franklin Mayo.

Detroit—L. B. Fijus, Bijur Motor Lighting Co.

Chicago—E. G. Dann, Dann Oil Cushion Spring Insert Co.

Syracuse—T. G. Meacham, New Process Gear Corp.

Amesbury, Mass.—P. E. Whiting, S. R. Bailey Co.

Optimism characterized the meeting of the Chalmers dealers in New York, Monday night, at Thomas Healy's. There was not a long face in sight; everyone looked and talked optimism and without any artificiality or forced boosting the feeling seemed predominant that the coming of the new year will bring, as Charles Chalmers of Philadelphia said, a rift in the clouds through which the sun will shine.

There were dealers from as far away as Los Angeles and Kansas City, and the dinner opened with a swing and dash at 10 o'clock. In the bunch of more than 100 were a score of factory men and as many more from the New York branch. President Hugh Chalmers sat at the head of the table with Isaac F. Marcossion, the writer; E. E. Schwartzkopf, of Gray & Davis; General Manager Olwell and several other guests and factory officials.

The dinner began with a cocktail and was supposed to end with a dessert, but the beef sandwiches were so good that some of the dealers made several courses of them; every man wore a carpenter's apron, which disappointingly covered up the half dozen evening dress shirts present.

Hugh Chalmers started the optimism with the opening address of the evening. He averred that the things which make for prosperity are still with us and that President Wilson wasn't so far wrong when

he said the business depression was psychological. The freight rate increase, he said, he believed to be a first step to better times.

"If you are pessimistic and allow it to blind your vision," he said, "you will never get anywhere. The sun is many times bigger than a dollar, but you can hold the dollar so close to your eye that you can't see the great big sun. **If we don't close the new year in a manner satisfactory to ourselves it will be one-tenth business and nine-tenths man.**"

The speakers urged the dealers not to talk war; that there was a war was regretted, but seeing it has come it was considered an advantage for American trade and business.

Lee Counselman, former general manager, urged every man to put enthusiasm and dash into his selling; he said he never knew how good a Chalmers car was until he left the factory for the retail field and got a different perspective. He said every man would get stale if he didn't move around a little.

Marcossion told several funny stories and thereby became one of the volunteer vaudeville squad of which the rivals for leadership were "Old John" Nelson of Kansas City, and Mason B. Hatch of Buffalo; both took the floor when the regular talent became scarce and received applause—and



The Chalmers dealers wore aprons and ate beef sandwiches at the dinner at Healy's. Informality was the order of the evening. Several helpful talks were given, nobody talked war, nobody knocked anything and everybody had a good time.

other things. John Mackie, of the factory, also held the spotlight. Among those present were:

John Lorentz, New York; Gus Ehrlich, New York; Fred H. Van Dorn, Red Bank, N. J.; Leon B. Brower, Red Bank; Frank Bullis, Detroit; Charles E. Thompson, Detroit; J. Walter Norcross, Springfield, Mass.; H. W. Reynolds, Bristol, Tenn.; Earl C. Anthony, Los Angeles.

Harry N. Pyke, Boston; W. D. Howatt, Port Chester, N. Y.; William F. Sternberg, New York; Thomas M. Kirker, Boston; J. H. W. Mackie, Detroit; A. Roy Camp, New York; J. A. Clark, New York; E. P. Nussbaum, New York; William J. Whipfall, Nyack, N. Y.; L. E. Sheldon, Springfield, Mass.

J. M. Sterling, Pittsburgh; D. M. Lasher, Detroit; R. T. Parry, New York; T. E. Rowe, New York; R. H. Woodhull, New York; F. H. Jaeger, New York; J. H. Shanahan, New York; Asa W. La France, Elmira, N. Y.; Carl M. Green, Detroit.

C. M. Steele, Detroit; Charles A. Woodruff, Detroit; C. C. Hinkley, Detroit; B. G. Koether, Detroit; F. W. Macrae, Detroit.

Omond S. Baninger, Charlotte; B. A. Burtin, Schenectady; E. P. Mander, New York; J. Harry Lawfer, Allentown, Pa.; William F. Coleman, Paterson, N. J.; George E. Metzger, Paterson; D. T. Smith, Paterson; Henry Stoehr, Paterson; J. P. Aude, Brooklyn; H. F. Earl, Brooklyn.

H. W. Skinner, Utica; Charles Millard, Newburgh, N. Y.; John Van Benschoten, Poughkeepsie, N. Y.; E. H. June, Binghamton; John A. Wilson, Detroit; R. B. Fleigh, Hagerstown, Md.; Herbert M. Hartman, Baltimore; George D. Dunham, Detroit; John A. Nelson, Kansas City; Mason R. Hatch, Buffalo.

W. A. Maynard, New Haven; G. Gombardi, New York; J. Howard Marlin, New Haven; W. A. Cahill, Boston; A. P. Bergeren, Keene, N. H.; G. T. Barrett, Keene, N. H.; Ormond L. Blake, Keene, N. H.; F. P. Allen, Boston; George Paddock, Newark.

L. B. Zusi, Newark; W. J. Skehan, Augusta, Me.; P. H. Lord, Lewiston, Me.; George Awagg, Portland, Me.; Charles L. Hanna, Syracuse; F. L. Beardsley, New York; F. G. Pennal, Montreal;

E. C. Sawyer, Asheville, N. C.; O. H. Coolidge, Rutland, Vt.; A. T. McDermott, Scranton.

W. E. Straw, Wilkes Barre, Pa.; R. P. Bowman, Detroit; Joseph H. Greenwald, Cleveland; Harry Unwin, Brooklyn; E. G. Pandow, Brooklyn; John J. Hogan, Lowell, Mass.; Charles H. Bowers, Boston; John A. Cahill, Boston; Elwood M. Bayne, Detroit; A. H. King, Detroit; J. E. Fields, assistant sales manager.

Fisk Reduces Prices on Tires

The Fisk Rubber Co., New York, has revised its price list showing a drop in several of the popular sizes. The prices on the plain tread casings remain about the same. The prices on white non-skid casings and gray tubes are reduced. The discounts and terms on this list are the same as on previous lists. The following list gives the changes, if any, on several of the popular sizes:

Size	Former Price	New Price
30 x 3	\$12.30	No change
34 x 4	26.35	\$25.65
35 x 4	27.20	26.45
36 x 4½	37.10	36.85
35 x 5	42.40	41.65

The gray tube 30 x 3½ was formerly \$4 and is now \$3.70. The red tube has no change while the Red Top tire and tube are about the same as those on white non-skid and gray tubes heretofore.

Motz Wins Patent Suit

The Motz Tire & Rubber Co. has won out in a suit brought against it for alleged infringement on a cushion tire with undercut sides. Messrs. E. B. Cadwell, F. P.

Johnston and F. M. Ashley, each holding a one-third interest in Patent No. 887,997, issued May 19, 1908, were the plaintiffs. Mr. Cadwell was the inventor. The prayer for injunction was denied by the court. Albert T. Scharps, attorney for the Cadwell interests, states that an appeal will be made.

Remy Acquires Detroit Location

The Remy Electric Co., Anderson, Ind., has purchased a tract on East Grand boulevard, Detroit, near the Packard Motor Car Co.'s plant, having a frontage of 500 feet and a depth of 150 feet. A building to house the engineering, experimental laboratories and drafting departments, as well as the Detroit branch and service station, with about 20,000 feet floor space, three stories high, will be erected. It will be ready for occupancy in two or three months, at which time the departments mentioned above will be moved from the main plant at Anderson, Ind.

This move was influenced by the increasing volume of the company's Detroit business.

Motor Dealers Meeting Postponed

The meeting of the Motor Dealers' Contest Association which was to have been held Monday at 12:30 at 222 West 59th street, New York, was postponed for a week; no quorum was present.

PART OF THE MAIN FLOOR AS IT APPEARED IN ITS SHOW DRESS



Dealer's Legal Status

The Car Has a Right to Cross the Sidewalk in Leaving a Garage But Driver Must Exercise Care—So Must the Pedestrian—Ordering of Driver Determines Liability

By George F. Kaiser

Editor Motor World:

What right has a motor car on the sidewalk? If a motorist attempted to drive on a sidewalk he would speedily be placed under arrest. In what way does crossing a sidewalk to enter a garage, or backing out from a garage into the street, differ from driving on a sidewalk? Has a motorist any legal right to cross a sidewalk in that way?

New York.

S. M.

It is true that sidewalks are, in the first instance, meant for pedestrians, and the streets are meant for vehicular traffic. There is no one, however, who would dispute a pedestrian's right to cross a street to get to the other side and, in the absence of statutes, he is allowed to cross at street corners or in the middle of the block if he so desires.

May Cross in Careful Manner

The same is the case with motor cars. Their proper place, of course, is on the street, but if it is necessary to cross the sidewalk to enter a garage or, when backing out from a garage it is necessary to cross the sidewalk to reach the street, there is no restriction on their doing this, if they do it in a careful manner.

Not long ago a case was tried in the Missouri courts in which a street sweeper recovered judgment of \$3,500 from a garageman.

The street sweeper had been standing in the center of the street talking to a friend who had stopped his wagon, when a motor car, being backed out of a garage, crossed the sidewalk, curved into the center of the street, and struck and injured him.

The court held that the street sweeper was entitled to judgment because the car had its top up and the chauffeur failed to look behind him. There was no limitation placed on the right to back out of the garage and cross the sidewalk into the street, except the court held that he must use care while backing out and must not be negligent.

Pedestrians must also use care when passing a driveway along which cars are

constantly moving to reach the street, but as the walk was primarily intended for them they may not be required to use the same degree of care as the motorist.

The question will probably never be seriously raised in any law suit. Horse-drawn vehicles have habitually been driven across sidewalks on leaving and entering stables for years, and it does not appear that their right to do so has ever been questioned. The motor car having equal rights on the highways with horse-drawn vehicles, naturally possess like rights with regard to crossing walks.

It would not be surprising, however, if some of the cities or towns in this country should put into effect a law containing provisions necessitating motor cars having signals at each entrance to a garage in the daytime and danger lights at night.

ONE WHO DIRECTS DRIVER IS LIABLE

Another case where an injured person sought damages for personal injuries caused by the negligence of a chauffeur paid by one party and hired by another was recently decided in New York.

The company was able to show that, although it actually was the owner of the motor truck at the time of the accident, it had rented it to another company under an agreement by which the latter hired the chauffeur and assumed control over him by giving him orders and directions where to go and what to do.

The company owning the truck, however, under its agreement undertook to pay the chauffeur.

The court decided that, when in a case like this a person is injured through the negligence of a chauffeur driving a motor car, the injured person should sue the person renting the truck and not the owner if the former exercises control over him by giving him his orders and that the fact that by agreement the owner may promise to pay the chauffeur's wages, does not render him liable

for damages for injuries to persons caused by the chauffeur's negligence. (Diamond vs. Sternberg Motor Truck Co., 149 N. Y. S. New York, 1,000.)

The problem of when a car owner is responsible for injuries caused by the negligence of a chauffeur is a vexing one. This problem may come up in a number of different instances, as for example, in a case like the one above mentioned; in a case where a car is loaned; in a case where a car is stolen; in a case where a car is being used by some member of the owner's family, or some officer of the company—if it be a corporation; in a case where a car is being demonstrated or tested, or it is being delivered by a shop where it was repaired.

Whoever Gives Orders Is Liable

In all these cases to find out who is responsible it is necessary to find the person who had the right to give orders to the chauffeur at the time of the accident, or one whose business the chauffeur was engaged in at the time of the accident.

The various court decisions on the liability of a dealer or owner are interesting. In one case where a dealer stored a car and furnished a chauffeur the dealer, and not the car owner, was held responsible for accidents. In another case, however, the dealer was absolved from blame when a car was driven into a paint shop by an owner's chauffeur who ran down and injured a man. In still another case a dealer selling a car was defeated in an action by a person injured while the dealer's chauffeur was demonstrating the car to the customer; and in still another case a dealer had judgment rendered against him in an action brought by a person who was injured through the negligence of a customer who was being taught to run the car, which he had just bought, by one of the dealer's salesmen.

To Test Truck Fenders in Chicago

Provided a practical device is discovered in a series of tests, all motor trucks operating in the city of Chicago must be equipped with fenders on and after March 1, 1915. There is one ordinance, passed in June, 1913, providing for fenders on motor trucks, but it never has been enforced for the reason that it does not stipulate what kind of device shall be carried. A new ordinance, passed in October but which was published for the first time last week, is an amendment to the old one and provides for the holding of a series of tests to determine upon a device. A meeting has been called by the Trade Association to discuss the ordinance.

Last Minute Car Arrivals at the Show

Niceties in Chassis and Body Construction

From a dealer's point of view, the 15th annual National Automobile Show—to give it its full title—ought to warm the cockles of more than one person's heart. For, as already has been made plain in the Before-Show issue of *Motor World*, it is largely a comfort show, with practically every effort of the manufacturer aimed either at making easier the lives of those who ride, or rendering easier the lot of the distributor who operates a service station. And the efforts of the manufacturers whose products are displayed amply reflect these tendencies.

Divided Front Seats

As a comfort feature, the divided front seat, which is not yet a year old, is more than ordinarily prominent. When the first of the crop of 1915 cars commenced to come through the factories of the country not more than three or four makers had attempted the not altogether easy problem of providing plenty of elbow room in seats which must, of necessity, be fairly close together but which it was desired to have entirely separate

But that this type of seat has come to stay, and in all probability will show a considerable increase within the next twelvemonth, is revealed by the long list of makers who have redesigned bodies to fit it.

Separate Roadster Chairs

Among the cars that were first exponents of this type of construction, the National, in which the idea has been carried somewhat further than in any other, the Pathfinder and the new Peerless "all-purpose" bodies are excellent examples. To those who seem skeptical of the wide appeal of these individual comfort chairs a seat in any one of the dozen or more cars which are so constructed should prove easily convincing. Not only do these seats provide all the room ordinarily provided by the usual undivided seat, but they afford a feeling of snugness and security which is far from being displeasing. The aisleway which is provided between the seats is of sufficient genuine utility to speak for itself.

Individual seats in roadster models, of

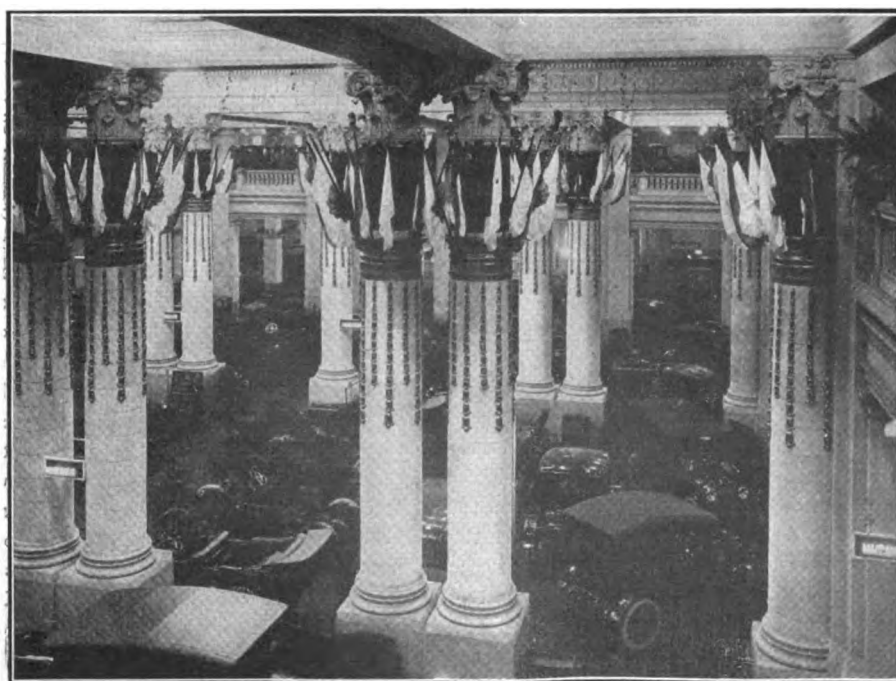
course, are common, though a number of makers have carried even this construction to a more logical conclusion in that the seats have been made easily adjustable. The Lexington, for one, is an example of this kind. The individual seats are unusually roomy and both of them may be adjusted to accommodate the space to the length of the occupant's legs. At the back of the seats there is a large space which serves for the storage of tools, luggage, etc. This particular model is finished in a durable shade of egg-shell gray, with the upholstery in black patent leather.

The complete isolation of the two seats has been carried still further in two noteworthy examples of the modern roadster—the Briscoe and the Owen, cars which are very nearly at opposite ends of the price classification. In both of these models there is evidenced the growing tendency toward increased capacity which is revealed not only in touring cars, which, in general, have larger and roomier bodies, but in sedans, coupes, cabriolets, and, in fact, throughout the whole line of bodies.

Seats Placed in Echelon

Although both models are the orthodox roadster in appearance and construction, both provide accommodations for three passengers, the design being along very similar lines. The two principal seats for the driver and his right-hand man are widely separated by an aisleway, which gives access to a roomy third seat placed as the military authorities would say, in echelon; which means, briefly, that the third seat is slightly behind the other two. Thus, the occupants of all three seats have ample shoulder room. Another point of similarity between these two otherwise widely separated cars is that both have sloping, shapely rear decks.

In the Owen, a departure from the usual practice, and one which should prove acceptable, has been made in the method of stowing the top. When this highly essential accessory is not in use it disappears completely into a compartment



A view from the first balcony across the main floor reveals how thickly populated is the show and how broad the aisles which were not always so empty

which is built into the body and is not ordinarily perceptible, whether the top is up or down. As far as is known only one make of touring car incorporates a staggered seat arrangement. This is the new Chevrolet, which, incidentally, created some sensation by reason of its excellent appearance and low price. This car nominally accommodates four passengers, but when it is desired to carry a fifth passenger a section of the rear cushion can be shifted back several inches, providing the necessary shoulder space for three instead of two.

Tops That Disappear

Two other cars have tops which completely efface themselves when they serve no useful purpose. One of these is a Lewis VI roadster and the other is a Fischer touring car, which bears the distinction of being the only car in the show to have a motor other than the standard poppet-valve or Knight sleeve-valve type; it is equipped with a Fischer sliding crescent valve motor. The method of housing the top of these two cars is widely different, however. In the Lewis the top disappears into an integral compartment within the external dimensions of the body, but in the Fischer the top compartment is built as an extension at the top of the body lines and has a slight overhang.

But though the divided seat roadster has cropped up in several not altogether expected places, the outcropping has not kept pace with the increase in number of divided front seat touring cars. To the pioneers in this field there have been added such makes as Westcott, one model of which is tastefully finished in gray whipcord; Davis, Premier, Crawford, which is attractively finished in two shades of dark red; Winton, in which the predominating body color is canary yellow with a delicate black striping; Cadillac, Cole and Kissel.

The plenitude of bright colors which



At the Chalmers exhibit, on one of the main aisles, the new six-cylinder chassis never failed to attract a crowd

is to be found on every floor of the Palace where cars are displayed would seem to indicate that the tendency of a twelvemonth ago toward more sombre hues has not altogether lived up to its promise. Whereas a year ago there were not more than three or four red cars, and still fewer yellow and blue ones, this year there are six or seven red ones and there are quite a few makers who have not been averse to decking their cars out in canary or any one of the several shades of blue. Furthermore, it is a noteworthy fact that the more brightly colored cars which serve to give contrast are for the most part stock jobs and not, as was more often the case a year ago, special from stem to stern.

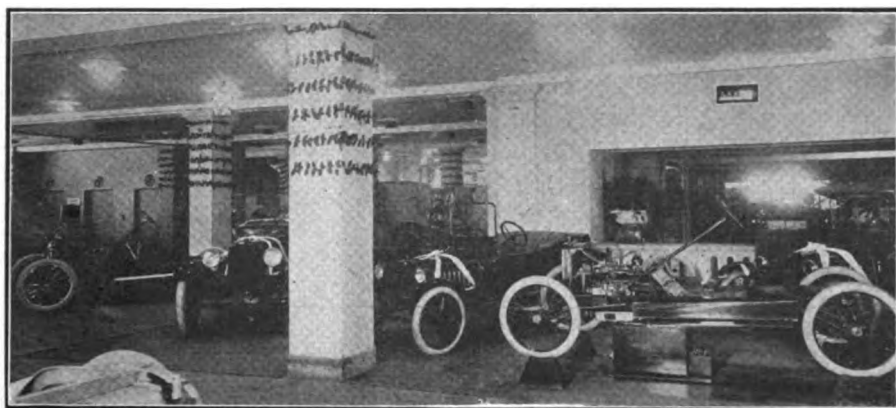
The National exhibit probably holds a larger number of different colors than any other exhibit, with the Packard display a close second, though despite all these colors the delicately upholstered

creations, which last year and the year before were surely entitled to the designation "show cars," are particularly conspicuous by their absence.

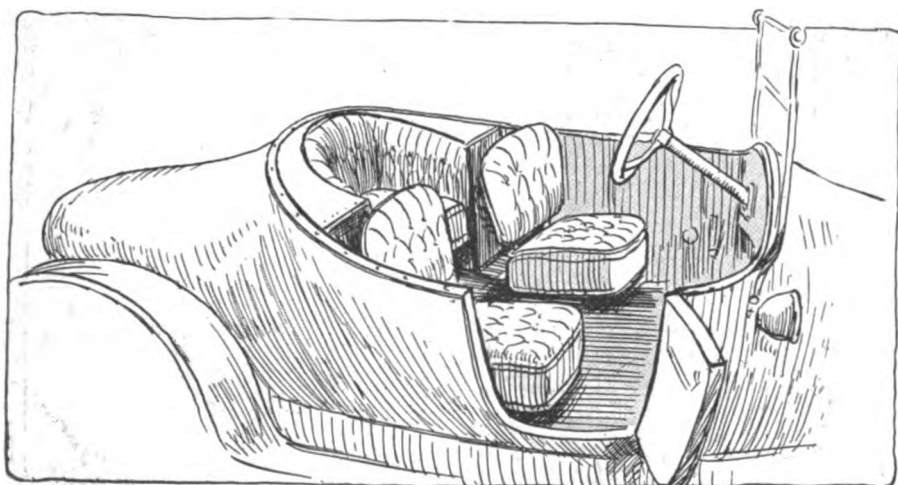
National's Boat Bodies

By far the most conspicuous of the four cars at the National stand is an unusually roomy coupe—it is almost a sedan—the body of which is finished in canary yellow with the lower door panels and the wheels and running gear, including the under side of the fenders, in red. One of the touring models is finished in almost exactly the same manner, except that the red door panels are missing. A second touring car is finished in a beautiful shade of blue with a broad gold band circling the body at the top. A third touring model is finished in a more subdued tone of gray with little or no embellishment. In the two former models the distinctive style of nautical construction original with the National company is adhered to, and the individual seats running on their little rollers are a never-ending source of delight to the crowd that always makes it difficult to get near enough to these creations to make a real study of them.

At the Packard exhibit the particular car that probably attracts the most attention is a roomy sedan model which is finished in a delicate shade of green set off by canary yellow window sashes and running gear. One of the Packard touring models is finished in dark green, which shade, by the way, appears to have been popular with quite a number of others designers as well. Thus, for in-



The electric cars are all grouped together, five makers being represented—Rauch & Lang, Ohio, Detroit, Baker and Waverley



The Briscoe roadster has divided forward seats with the seat for a third passenger placed "in echelon" or in the rear

stance, at the Pierce-Arrow display there is a coupe finished in olive green and black to which a note of individuality is added by a commodious rear compartment with a luggage carrier mounted atop. That shade of dark green which is almost black is a staple and is apparent in every section of the show. Peerless, for one, has a comfortable-appearing roadster in this shade and at the Fiat stand there is a luxurious limousine finished in dark green cleverly set off by black striping and gray whipcord upholstery.

Extreme Streamline Design

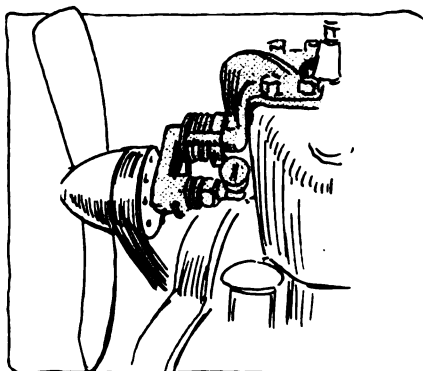
In the class of cars which compel attention in a more certain manner there are two very striking Cunningham models. The first of these is a roadster in which the streamline principle is so plainly apparent as to be unmistakable. The body lines are flowing in the extreme, with the engine hood blended cleverly into a very deep cowl mounting a windshield in which such wood fittings as there are are natural finish. The body is finished all over in very dark gray with fairly broad white striping.

The second Cunningham model is what is styled an open front limousine and closely resembles what is usually known as a brougham; there is a detachable roof which fits over the driver's compartment making the car into a true limousine. The upper portion of the body is finished in that latest of Dame Fashion's shades which has come to be known as sand- or putty-color. The trimming is in mulberry. This scheme of sand-color and mulberry has been carried out very cleverly in the upholstery, which is done throughout in velour, there being alternate vertical stripes of these two colors. Except for this the interior is almost severely plain. Out-of-the-ordinary fittings are apparent in the use of individ-

ual seat cushions and a velour-covered adjustable roll which serves as a footrest. A final touch of distinctiveness is lent by canary yellow wire wheels and silver-plated metal trimmings. The price of the car is \$5,000.

Cole's "Cubist" Roadster

In the way of unusual cars it is doubtful if there is any that is more unusual



The fan on the new Case has but two blades and the belt is spring tightened

than the Cole "Cubist" roadster. In this, too, there are divided seats, though they are divided in an entirely different man-

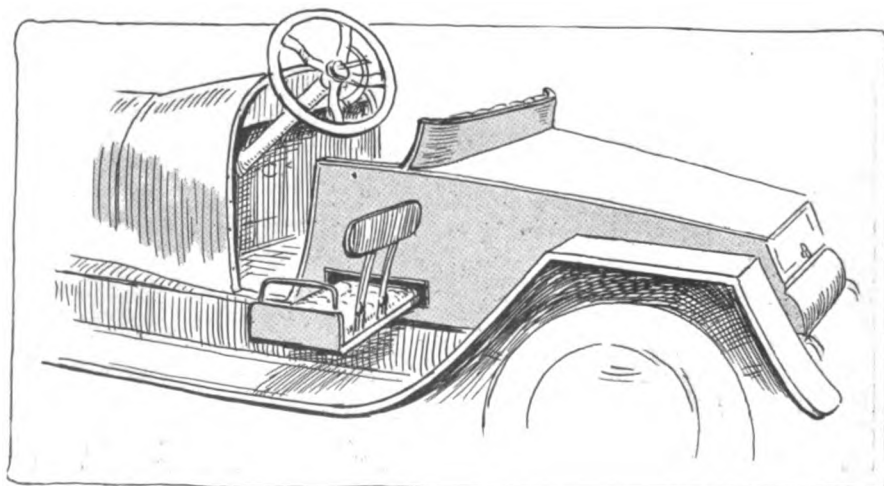
ner. In the first place, all the body lines are severely straight. The after deck is almost rectangular, and, of course, provides that much more storage space. The fenders, both front and rear, are devoid of curves, angles frankly taking their place. The usual roadster seats are roomy and beside each there is an auxiliary seat which folds and slides in like a drawer. Thus, there are accommodations for four passengers. The body is finished in slate gray set off by bright red leather upholstery.

Sedan With Skylight

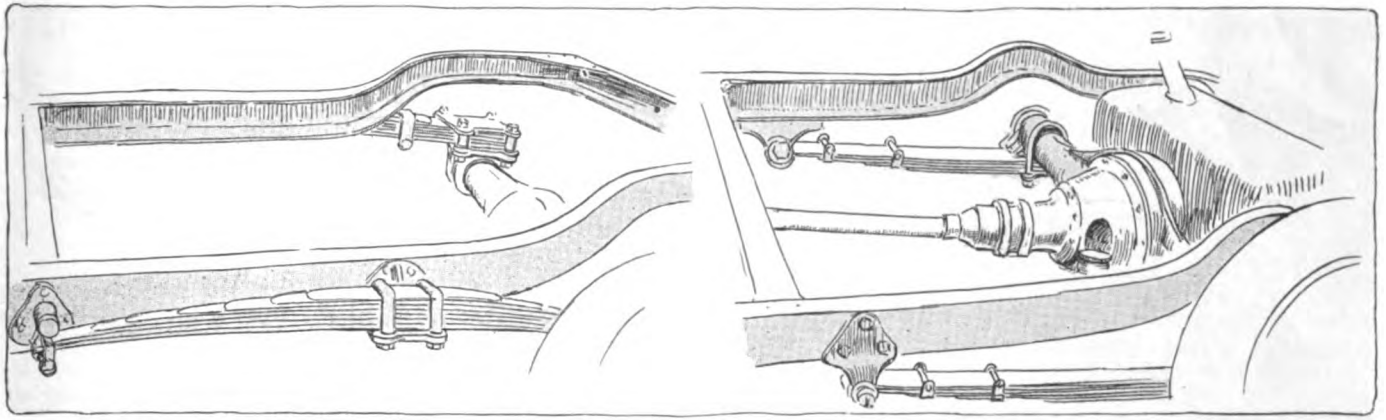
Quite as attractive in another sort of way is a Lewis VI sedan, which differs from everything else of its kind in a number of respects. It is finished in canary yellow with green hairline striping and in the roof there is a large skylight which may be closed by a silken curtain. At the back there is a large compartment to house a spare wheel. The windshield is unusual in that it is double, the inner portion sliding vertically in felt runners and the outer hinging upward to give a rain-vision effect.

Of the cars which make their first appearance, none is decked out in conspicuously bright colors with the possible exception of the Owen roadster, which is red. The others all are finished in the more sombre tones.

Among the cars that are not brand new but which exhibit new features, there is the Case, which has undergone no little change and appears for the first time in its new form. The most noticeable change which has been made is in the adoption of cantilever rear springs with a corresponding increase in wheelbase length from 110 to 115 inches. At the same time an improved type of multiple-disk clutch has been added and the size of the tires increased from 32 to 34 inches. The fan is new, as is the method of adjustment, which is automatic, the



The Cole "Cubist" roadster is frankly angular in its appearance; the auxiliary seats at either side slide in out of sight like drawers



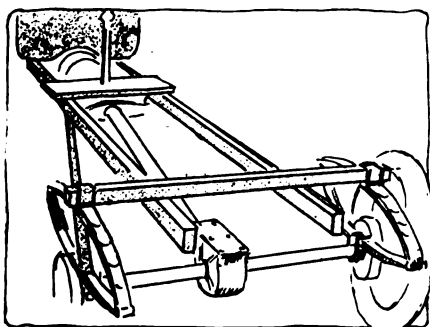
DIVERSITY IN SPRING SUSPENSIONS—Left shows the mounting of the cantilever members on the new Pilot model; note axle anchor. Right shows the long underslung semi-elliptics used on the Mercer

belt being kept under spring tension. The fan itself is of the modern aeroplane type and has but two blades. Oil cups have been placed on the steering spindles in place of grease cups and the gasoline tank has been placed in the cowl. There is an ingenious oil pump indicator in the form of a ball topped metal rod in a dash casing which rises and falls as long as the pump operates properly. If the pump stops, the ball remains invisible, thus giving warning.

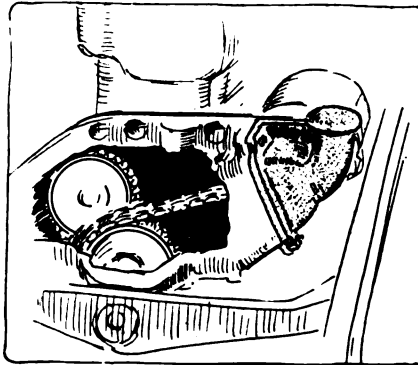
Premier Line Revamped

Another car that has been considerably revamped is the Premier, which now has a modern streamline body with divided front seats and exceptionally clean sides. The rear axle now is a Timken with spiral bevel gears and among other things a new intake manifold of the ram's-horn type has been placed on the motor, though the size of the cylinders and the general motor design remain unchanged. Other changes include the adoption of Stewart vacuum feed to the carburetor, the adoption of a new Kellogg power tire pump and Remy combined electric lighting, engine starting and ignition system. One of the accessibility features of the chassis is a long extension filler cap for the gasoline tank.

The detachable sedan and coupe top appears to be gaining in popularity, sev-



Argo springs are mounted at the ends of a bar which extends beyond the frame



Accessibility is a feature of the Dodge Bros. cars; this shows the oil filler

eral cars being equipped with tops of the kind. The Kissel, of course, is not new, nor is the Pathfinder. Both the Hupmobile and the Krit have tops of the kind for the first time, however.

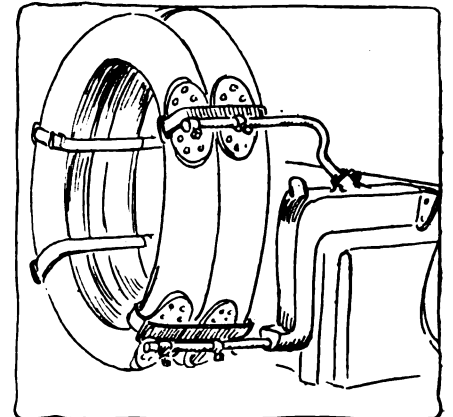
Special Locomobile Bodies

Both the Locomobile and the Oakland companies reveal new brougham types, the former being a special job from the custom department of the company. It is a clever imitation of a smart horse-drawn carriage of earlier days and

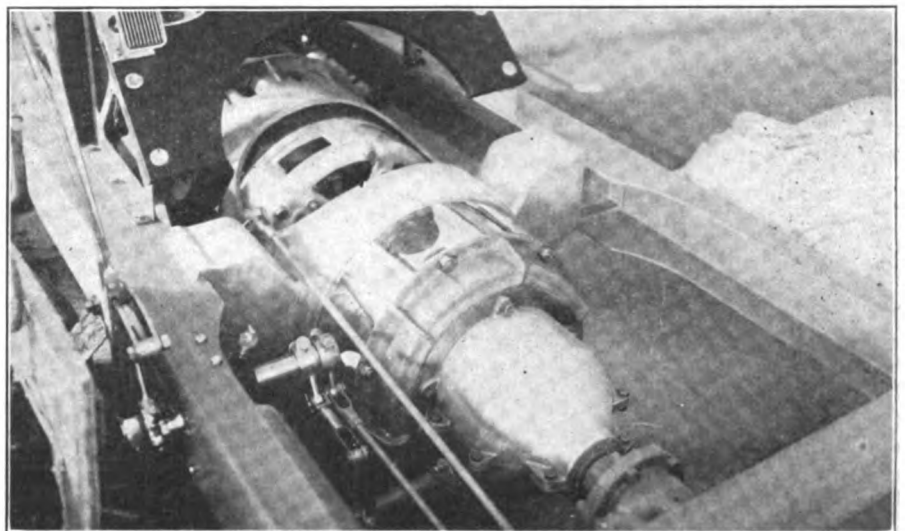
has such distinctive touches as individual steps and separate mudguards, three to a side. The Oakland brougham is a stock body which will be kept as standard; it sells for \$2,500.

Owen's Weidely Revised

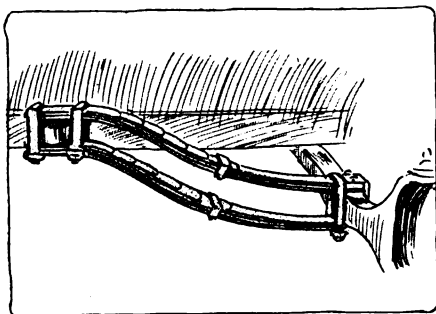
The Owen car, with its Entz magnetic transmission system, is fitted with a Weidely motor which has been altered somewhat though the general principle



The tire carrier on the Westcott is unusually substantial and protects the fuel tank as well



The Owen car is devoid of clutch, flywheel, gearset and separate lighting and starting apparatus, the Entz magnetic transmission taking the place of all



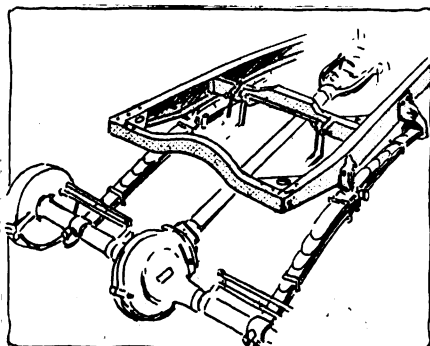
A form of double quarter elliptic springs is used on the new \$490 Chevrolet

remains the same. The drive for the overhead camshaft now is taken from the front end of the motor to the center on a straight shaft running horizontally within the crankcase in the same manner as an ordinary camshaft. From this point it is taken vertically upward by the spiral gears to the overhead camshaft which it operates from the center, the shaft being in two lengths. The crankshaft has also been stiffened.

Comfort Is Now the Watchword

In none of these cars, new or not so new, is a very protracted search necessary to discover at least some of the comfort features that manufacturers have built into them. The Reo line, for example, has a clever coupe model in which a seat for the third passenger folds forward and when not in use is flush with a slanting toeboard. Also, the new type of smoothly rounded hub caps that are a new Reo feature cause comment. In these cars, as in a number of others, the lighting and engine starting controls are contained in a tiny cylinder fastened to the steering column.

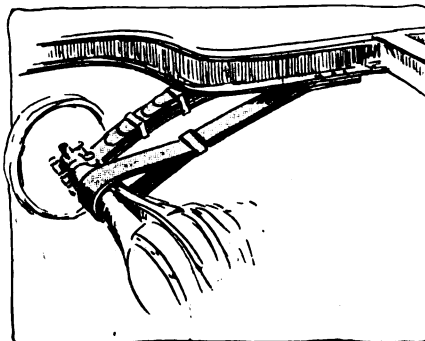
It was to be expected that the new Dodge Bros. cars would attract attention and as a matter of cold fact it was seldom possible to get closer to them than four interested sightseers. They are unusually clean-appearing creations in which there is evident a careful attempt to make easier all the attention that is so essential with any car. One example will serve to emphasize this feature. The



The Dort frame has a high kick-up at the rear over the differential housing

oil filler is mounted well forward on the crankcase, where it is out of the way yet instantly accessible. What is more to the point it is generous in size.

The Westcott line has been considerably revamped and all the bodies have taken on a decidedly boat-like appearance. This line is one of those that exhibits for the first time the new divided front seat. In the touring models an unusual type of spare tire carrier has been adopted. This consists of two heavy arms which bolt to the rear frame

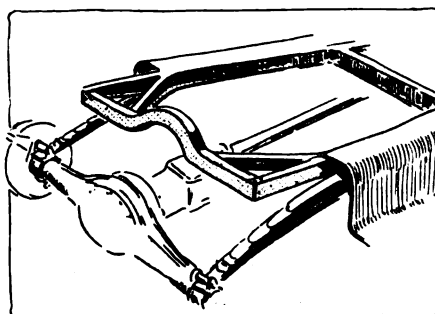


In the Lexington the cantilever spring is swiveled to the axle

member and are turned downward in such a way as to thoroughly protect the rear gasoline tank.

Steering Wheel Is Unobtrusive

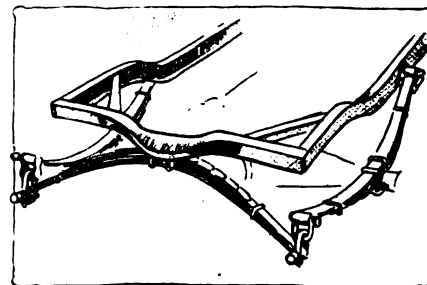
The King eight-cylinder car was another that was the center of an ever-shifting crowd of curious sightseers and not the least attention-compelling fea-



The Saxon six is another that has a kick-up in the rear frame member

ture of the car, barring the newness of its eight-cylinder motor, which, by the way, is an exceptionally accessible job, was a new steering wheel with which it is fitted. The wheel slides upward on a central bearing on the column in such a way that even the stoutest driver should have no difficulty in slipping in.

In spring suspensions and frame reinforcements there is a surprising amount of diversity apparent; no two makers seem to have adopted the same means to a common end. The new Chevrolet model at \$490 has a brand new form of front suspension which is unlike anything else



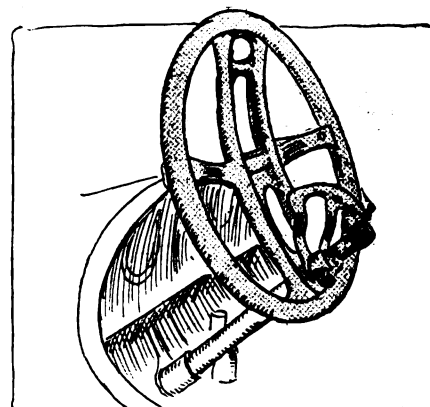
The Detroit platform spring is distinctive, the center anchor being housed

of its kind. There are two quarter elliptic members firmly fastened to the frame, one on each side of a block, thus dividing the two spring members. The upper spring member attaches above the axle and the lower beneath it. The rear springs are regulation quarter elliptic.

New Frame Ideas in Light Cars

The new Chalmers six has an unusual cantilever mounting in that the spring members are mounted directly beneath the side frame members with the rear of the spring attached beneath the axle. There is a rebound strap between the frame end and the spring clip. In the Lexington, on the other hand, the rear of the cantilever spring attaches to a swiveling clamp around the axle tube.

Frames in lighter cars exhibit distinctive features. In both the Detroit eight and the Saxon six, for example, there are long reinforcing members from the sides to the rear member. The Saxon has cantilever springs whereas the Detroit has three-quarter platform members with the center platform bearing housed in an extension of the frame. The frame of the Dort also has a kick-up over the differential housing and the cantilever springs are mounted beneath the axle. The Argo frame and spring suspension are radically different from anything else in that the frame is very narrow with the elliptic springs attached to a long cross member which extends on each side of the frame.



The King steering wheel slides upward, permitting easy entrance and exit

Nine Makers Lift the Curtain Revealing New Models

Mercer Line Revamped and New Throughout—High-Speed Motor

The new Mercers are entirely different from those of previous seasons with the exception that the policy of building medium-weight high-speed four-cylinder cars is continued. The low line and high speed for which Mercer has always been noted are also features of the new model, for in the touring car the side line of the body is only 45 inches from the ground and the speed is guaranteed to be one mile in 45 seconds or 80 miles an hour.

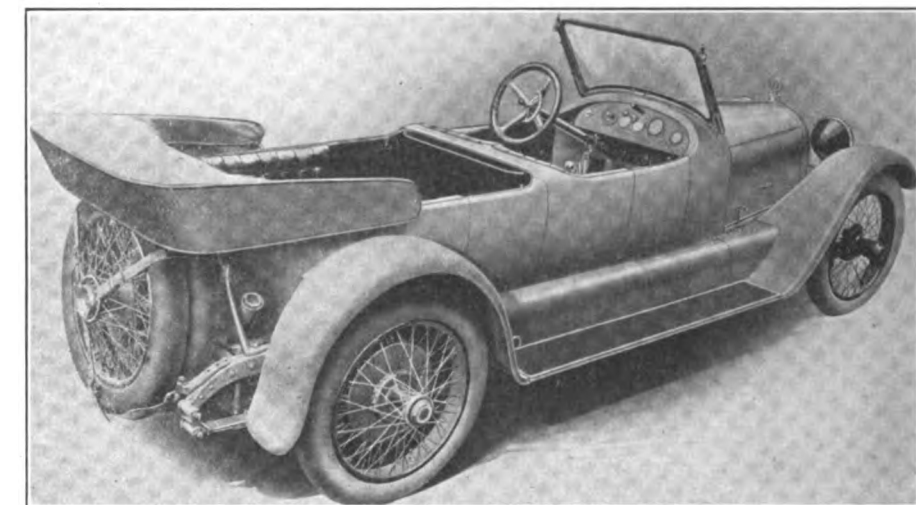
Four Bodies, One Chassis

Four cars, a six-passenger touring, four-passenger sporting, both listed at \$3,000, a runabout at \$2,900, and a raceabout at \$2,750 make up the line. These are all mounted on the same chassis with the exception that the wheelbase of the touring and sporting models is 130 inches while the raceabout and runabout have 115 inches.

The new motor is of Chief Engineer Delling's design throughout, as, in fact, is the entire new chassis, none of the previous Mercer remaining. The power plant is a four-cylinder $3\frac{3}{4} \times 6\frac{3}{4}$ L-head block with a piston displacement of 298.2 cubic inches. This gives an S. A. E. rating of 22 horsepower and the maker's rating is 70 horsepower at 1,800 r. p. m. The combination of these two horsepower ratings has given rise to the model name of the series, which is known as 22-70.

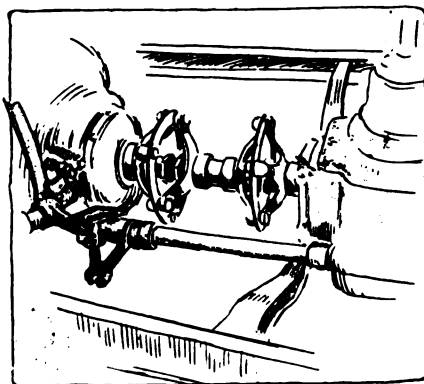
Simple Block Motor

New Mercer features are in evidence throughout the chassis. The valves are on the right side and are enclosed by an aluminum cover plate held in place by



Three-quarter rear view of the four-passenger Mercer sporting model showing well-rounded lines and raking windshield; the price is \$3,000

two thumbscrews. In connection with the block motor this cover plate gives an effect of simplicity to the exterior. This is heightened by the carburetor being attached directly to the cylinder cast-



Mercer clutch coupling, showing also the extreme accessibility of brake adjustment

ing which carries the intake manifold integrally. The magneto and water pump are set at the front of the motor and are driven from a cross-shaft. This arrangement keeps the sides of the motor smooth and clean. A web is cast be-

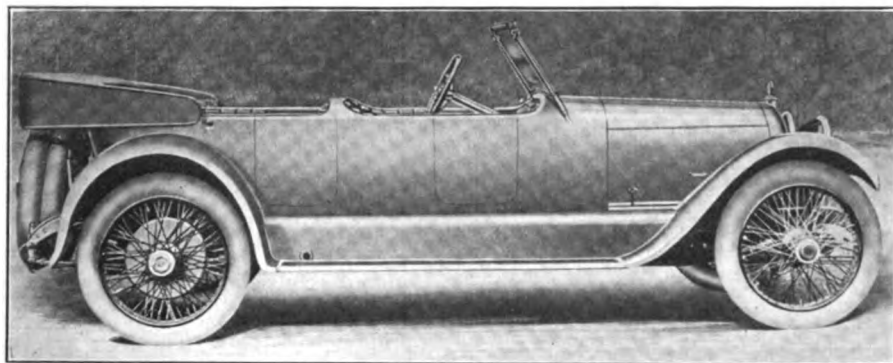
tween the arms of the crankcase, extending out to the frame on each side of the motor, forming a shelf which serves the purpose of a dirt seal, obviating the necessity for a mud pan.

Multiple piston rings are used. There are only two grooves in the pistons, both of these being above the wrist pin, but in these two grooves there are six rings, three $1/16$ -inch rings being used in each. The connecting rods are longer than usual, measuring 15 inches from center to center, thus reducing angularity to a large extent. In spite of the length the assembly is of light weight, as the rod with four bolts weighs but 4 pounds and 1 ounce. The crankshaft is $2\frac{3}{8}$ inches in diameter and both the main and connecting-rod bearings are of bronze lined with babbitt.

Transverse Magneto Shaft

The camshaft is driven by a 2-inch Coventry chain attached to the crankshaft and to a single camshaft gear. On the crankshaft sprocket is the worm gear, which drives the magneto and water pump cross-shaft. Since the magneto is on one side and the water pump on the other a balanced drive is given on the cross-shaft.

As would be expected from a motor designed for high speeds, the valves are exceptionally large, having a diameter of $2\frac{1}{4}$ inches. The valve stems are threaded at the end for carrying the spring retainers and the material is tungsten steel. By the use of the threaded valve stems the tension on the valve spring can be regulated by inserting a screwdriver in the slot on the head of the valve and turning to the required adjustment. If it is desired to change a valve spring or



Another view of the Mercer sporting model, showing the straight-line effect and the cowl back of the front seats; hood and cowl are well blended

to remove a valve it is possible to remove all the tension from the spring by turning the valve until the spring retainer is lowered sufficiently to take the strain off the spring. The pushrods and pushrod adjusting screws are good examples of how care has been taken in manufacture to keep the weight as low as possible. These are hollow. The lower ends of the pushrods are fitted with rollers which ride directly on the cams. The camshaft is carried on five bearings. It is of hollow section and is carried in a continuous oil bath.

High-Pressure Lubrication

Lubrication is by a high-pressure system. The oil is forced to all bearing surfaces under pressure varying from 10 to 20 pounds at slow speeds to 50 and 60 pounds at high speeds. The leads are all self-contained, there being no external oil pipes in any portion of the motor. The pump carries the oil directly to the camshaft and crankshaft bearings through leads drilled through the webbing in the crankcase casting.

Ignition is by single Bosch high-tension system and the balance of the electrical equipment is made up by a U-S-L starting and lighting installation. This operates at 12 volts and while worked out to the special requirements of the Mercer car does not differ materially from the general U-S-L system. The apparatus consists of a motor-generator which takes the place of the flywheel. The storage battery is of 100 ampere-hour capacity. The clutch is contained within the starting and generator housing on the sporting and runabout models. On the raceabout it is embodied in the flywheel, as no starting and lighting system is supplied with this model. The clutches for all bodies, however, are the same, being a dry-plate disk type.

The gearset provides four speeds and is provided with a distinctive locking device which does not permit the gears to be shifted unless the clutch is disengaged.

Underslung Rear Springs

The rear axle is floating. The springs are semi-elliptic all around, being $2\frac{1}{2}$ x 38 in front and on the touring and sporting models $2\frac{3}{4}$ x 58 on the rear. On the runabout and the raceabout the rear springs are $2\frac{1}{2}$ x 52. The rear springs are underslung and are located directly underneath the side rail. The drive is of the Hotchkiss type, both thrust and torque being taken through the rear springs.

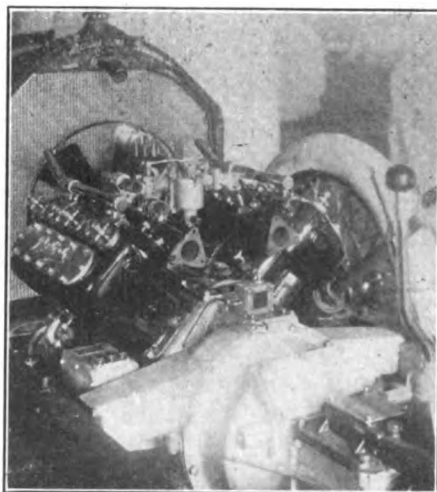
A channel section frame is used with an arch over the rear axle. The front

axle is an inverted Elliott design. The brake for service use is on the propeller shaft, while the emergency brakes are on 16-inch drums attached to the rear wheels. Both the shaft and rear wheel brake are internal expanding. The wheels are wire on the sporting and raceabout types and on the touring they are wood with Howard demountable rims. The wire wheels used are Rudge-Whitworth.

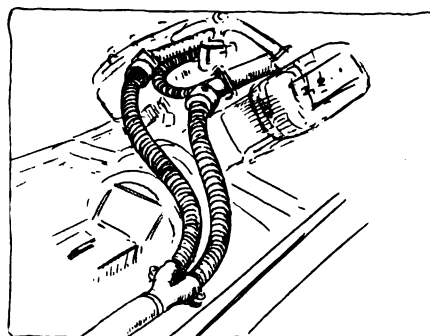
The cars are sold fully equipped, all models excepting the speedster design being fitted with a one-man top, Jiffy curtains, pump, jack, windshield, speedometer and a full set of tools. One the cars using wire wheels an extra wheel is supplied and on those using the wood wheels an extra demountable rim. The tire size is $34 \times 4\frac{1}{2}$ on the cars using the 130-inch wheelbase and 32×4 on the cars using the shorter or 115-inch wheelbase.

EIGHT-CYLINDER IS LATEST DETROITER

The Detroit eight, while announced shortly before the show, makes its first appearance. This car is equipped with a Perkins eight-cylinder motor with the cylinders cast in fours and arranged in a



Rear view of Detroit eight motor, showing arrangement of the accessories



Exhaust leaders in the Detroit eight are flexible tubes terminating in one exhaust pipe

V in accordance with the general scheme adopted by the users of the eight motor. Other than the new motor the car does not vary to any great degree from the previous Detroit. In fitting the new motor the wheelbase did not have to be altered and the entire remaining specifications of the car remain practically the same. The tires, however, are slightly larger, being 33×4 instead of the former $32 \times 3\frac{1}{2}$.

Cylinders in V Shape

The new eight motor is $2\frac{3}{4} \times 4\frac{1}{2}$, with the valves on the left for the left block of four cylinders and on the right for the right cylinders. The two blocks of four cylinders bolt to a common crankcase and have their center lines at an angle of 90 degrees to one another. With this arrangement a single crankshaft is used which is similar in design to that of a four-cylinder crankshaft. The connecting rods of opposite cylinders attach to the same bearing, one having a yoke end and the other a rod going between the arms of the yoke.

The carbureter is a Rayfield, one instrument being sufficient for the entire eight cylinders. This is mounted between the two blocks of four cylinders and so arranged with the intake manifold that an equal distribution of gases will be fed to both sides of the V. Ignition is by the Atwater Kent system and starting and lighting by the Remy two-unit device.

In revamping the chassis light weight has been sought in the use of drop forgings in place of castings. The gasoline tank is now under the cowl and while this was used in the four-cylinder model of this season it is still a 1915 departure for the Detroit company.

Clutch and Gearset New

The clutch is a cone and the gearset provides three speeds. Both these units are new as the clutch was a disk in the four-cylinder model. Both the clutch and gearbox are products of the Massnick-Phipps concern. Steering is on the left and is accomplished by a Gemmer gear. Control is in the center. Both the front and rear axles are of Weston-Mott manufacture.

So far the only body supplied is a touring, but both that and a roadster are marketed as regular stock models at \$1,295.

Equipment is complete as generally offered, consisting of a one-man top, speedometer, windshield, pump, jack and a full set of tools. The tires are Goodrich and are of the non-skid type in the rear.

TWO NEW DORT CARS FOR LESS THAN \$700

The Dort car, manufactured by the Dort Motor Car Co., a new concern which has recently incorporated for \$500,000 under the laws of Michigan and which consists largely of the stockholders of the Durant-Dort Carriage Co., is another that makes its first appearance at the New York show.

While practically on one chassis, as far as general design is concerned, the touring and roadster models which make up the line are carried on different wheelbases, have different size motors and different tires. The touring model, which sells for \$680 without starting, has a 105-inch wheelbase, 30 x 3½ tires and a 3¼ x 5 power plant. The roadster, selling for \$495 without equipment, has a 92-inch wheelbase, 30 x 3-inch tires and 3 x 4 motor.

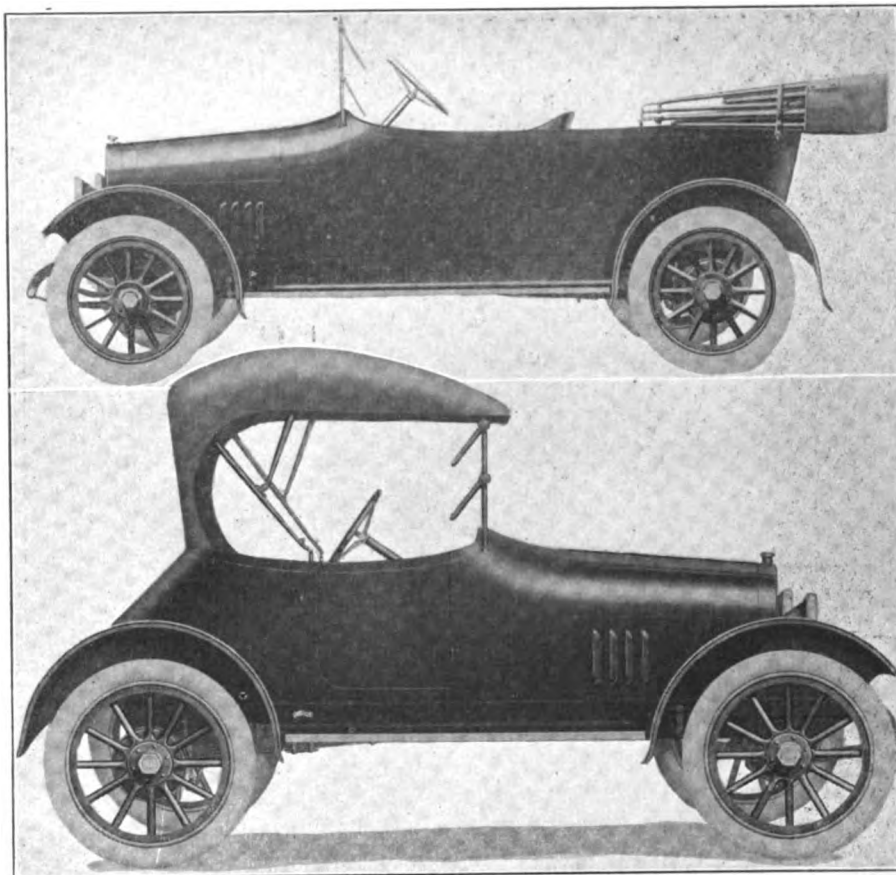
Block Cast Motors

Both chassis have the same characteristics in other particulars. The motors are block-cast having four L-head cylinders. The motor itself is a product of the Dort company, which is allied closely to the Chevrolet and other Flint industries. It is designed for light high-speed work with a two-bearing crankshaft. The crankshaft has a diameter of 1¾ inch and is carried on exceptionally long bearings, the front measuring 3 5/16 inches and the rear 4 1/16 inches. Another distinctive feature of the motor is the twin ejector type of exhaust. With this manifold, cylinders 1 and 4 exhaust in one passage and 3 and 2 in another, thus avoiding any chance of dead gases entering the wrong cylinder and at the same time helping to create a vacuum into which it is easy for the motor to exhaust at low pressure.

Ignition is by the Connecticut battery system and the carbureter is a Marvel Model H. The lighting and starting system, which, when supplied, sells for an additional \$45, is the Apelco. When this is, not supplied an acetylene generator and full set of lamps takes its place.

Nickel Steel Drive

The clutch is a leather-faced cone and the gearbox provides three speeds with a selective arrangement. A feature of the car is that the entire drive from the clutch to the rear wheels is taken through 3½ per cent nickel steel, as the gears in the gearbox, the 1-inch propeller shaft and the bevel-gear rear axle with its 1¼-inch shafts are all of this material. The spring suspension is a floating cantilever



Both Dort cars, roadster and touring, are modern streamline creations with smooth sides and well-blended lines. The touring model lists at \$680 and the roadster at \$495

with the drive taken through the torque tube. The manufacturer of the rear axle is Walker-Weiss.

The touring body has a five-passenger seating capacity and the standard colors are green and red with black. On the roadster, which seats two, the colors are black and green. The equipment on the touring car consists of a one-man top, electric horn, generator, windshield, speedometer, license brackets and a full set of tools. The equipment on the roadster is the same with the exception of the windshield.

REMINGTON SURPRISE EIGHT-CYLINDER CAR

One of the eight-cylinder surprises at the New York show is the Remington, fitted with a Perkins V motor in two blocks of four and selling in touring and roadster forms at \$1,495 on a 116-inch wheelbase. This car has joined the pioneers in the eight-cylinder field.

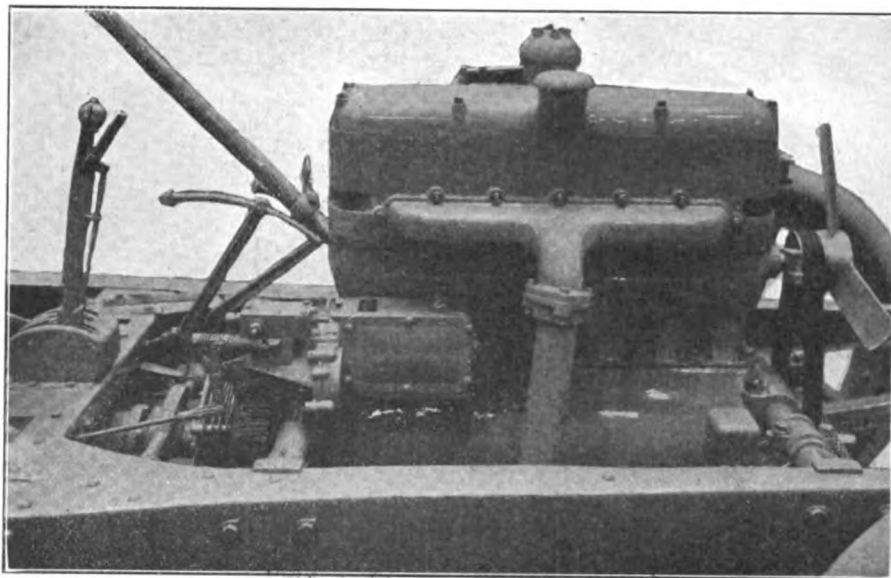
As is customary in the eights, the cylinders are L-head with the valves on the right side of the right block and the left side of the left block. A single crankshaft is used and the two blocks of four cylinders bolt to the common crankcase. The cylinder dimensions of the Remington eight are 3½ x 4½. The

connecting rods are the fork and yoke design, providing for a crankshaft which does not differ from that of a four-cylinder motor. The valves are operated off a common camshaft and a single carbureter provides for all eight cylinders through a symmetrically designed intake which is arranged to feed both sides of the V and to provide equal distribution of the gas.

Gray & Davis Equipped

Ignition is by a battery system and lighting and starting by Gray & Davis. The clutch is a disk and the gearbox provides three speeds. The drive is taken through a shaft and bevel floating axle of Salisbury manufacture. The wheels are wire and the tires 34 x 4 inches. Control is in the center and left or right drive is optional. Gear control is automatic and mechanical; the lever is set in anticipation for any speed and the gears engage when the clutch is thrown out and in.

The bodies furnished with this car are not radical departures from the moulded forms that have come into fashion during the past two seasons. They are of five- and two-passenger capacities and their standard color is Brewster green. The equipment included at the price consists of one-man top, windshield, speedometer, demountable rims with one extra.



The new Chalmers six motor has a one-piece removable head carrying valves and cages. The starting motor drives to the flywheel and the oil filler is at the top of the cylinders

OVERHEAD VALVES IN NEW CHALMERS MOTOR

Seen for the first time at the New York show, the Chalmers new six with its overhead camshaft motor is attracting more than passing attention. This car, selling at \$1,400 and having throughout the specifications of a sturdy design, is an event in the field of low-priced six-cylinder cars.

Single Central Camshaft

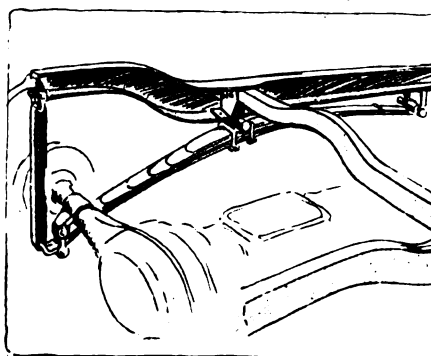
It is in the power plant that the most important features of this new car stand out. The $3\frac{1}{2} \times 5$ cylinders are cast in a block with a unit removable head. While the valves are in the head of the motor the drive is a new system for use in connection with this type of motor. A shaft which is a prototype of the ordinary camshaft runs transversely from the crankshaft to the right side of the cylinder block, where it connects through spiral gears with a shaft running vertically upward and driving to the camshaft.

None of this shafting is visible, but the vertical shaft is extended above the casing and on this is mounted the distributor for the Atwater Kent ignition system. The use of the overhead camshaft is designed to give a direct action on the valves and to overcome the objectionable noise which is apt to develop in long rods and linkage.

Enclosed Shaft Drive

The drive is taken by a dry-plate multiple-disk clutch which has alternate Raybestos and steel plates. The gearset provides three speeds and the drive is through an enclosed shaft with a torsion

tube bolted to the housing of the gearset. The axle is floating with a pressed steel housing. The rear wheels are carried on Hyatt high-duty roller bearings and the differential on Timken taper



The cantilever springs are beneath the frame and attach below the axle

rollers. The brakes are on the rear wheel hubs with the service set contracting, $14\frac{3}{8} \times 2\frac{1}{4}$ inches. The emergency brakes are internal expanding, 14×2 .

Sheet Metal Bodies Over Wood

The bodies are sheet metal over a wood frame and are made in five-passenger touring style only. They are on a 120-inch wheelbase and have 34×4 -inch tires. The equipment is complete, with a Gray & Davis two-unit starting and lighting system, one-man Pantasote top, windshield, double bulb headlights, demountable rims with one extra rim, Stewart speedometer, tire carrier, magnetic gasoline gauge, Klaxon horn, license brackets, ignition switch lock, Collins adjustable curtains, tonneau carpet, driving compartment rubber, robe and foot rails, pump, jack, full set of tools and tire repair outfit.

JACKSON AT \$1,250 HAS NEW FEATURES

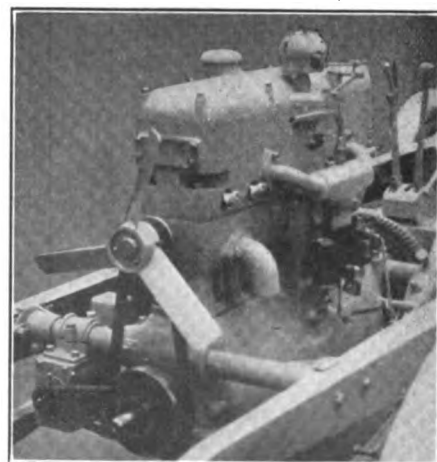
Another Jackson has made its appearance at the show. This is known as Model 4 and is really a new edition of what was the Olympic model last year. The power plant is the same as that used in the former Olympic. This is a Northway unit having the clutch and gearbox housings integral with the crankcase. The rear construction and the chassis framework is really the same as the former Jacksons, but there have been several interesting changes in other structural details.

Rear Springs Underslung

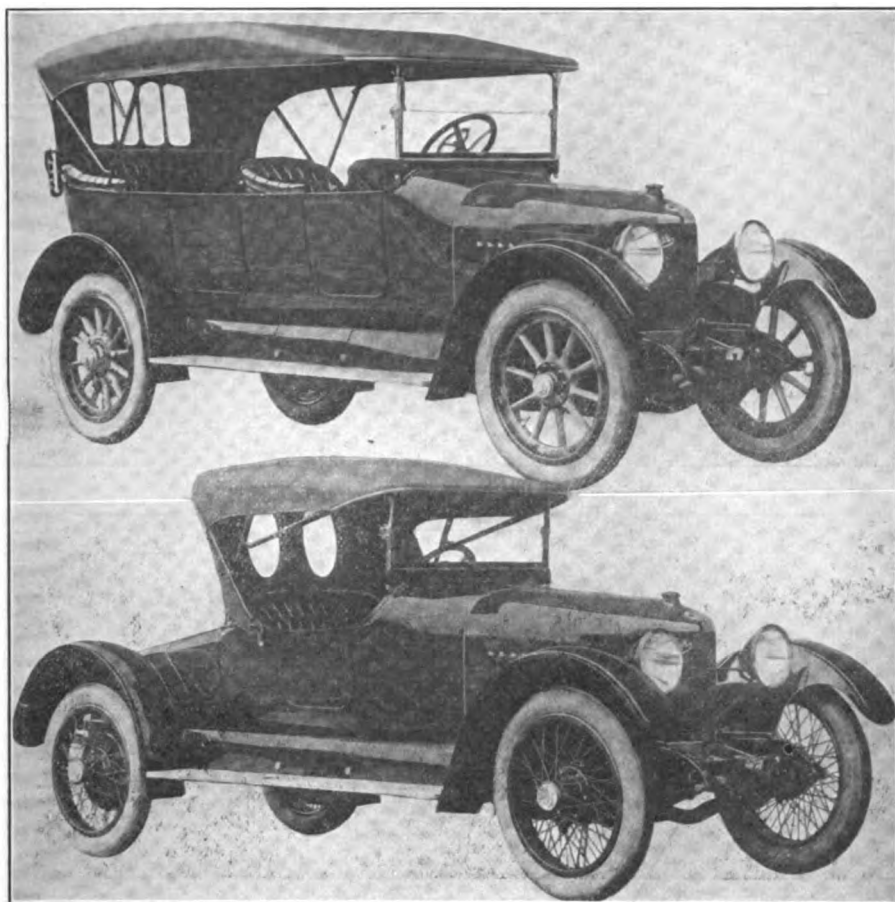
This model has a 115-inch wheelbase, 2 inches less than the Jackson of last season. Among the innovations for the Jackson company in this model is the use of a generator ignition system worked in conjunction with the Autolite starting and lighting outfit. The underslinging of the rear springs is another feature new to Jackson practice. This gives the car a lower appearance, which distinguishes it at once from the other and older cars.

The body work of the new car also shows some departures from previous practice. The tendency towards streamlines is new, the use of crowned fenders and double bulb headlights with no side lamps are also recent Jackson departures.

The motor has L-head cylinders cast in pairs. The dimensions are $4\frac{1}{2} \times 4\frac{3}{4}$. The gearbox furnishes three speeds. The rear axle is a floating Salisbury bevel design. The tires are 34×4 and non-skids are standard equipment in the rear. The car is sold fully equipped for \$1,250. It has a new type of one-man top, which is another feature making this car different from other Jacksons.



An aeroplane type of fan is used, this being the only exposed moving part



The sextette body on the new Premier has divided front seats with an aisleway between them and will be equipped with foyer lights in the tonneau. Lower shows the new roadster on the same chassis

CHEVROLET AT \$490 IS FULLY EQUIPPED

A new car at \$490 is the offering of the Chevrolet company, which is exhibited for the first time. This car, while smaller than any put out by the Chevrolet company in the previous season, follows very closely along the lines of the other Chevrolet cars. It has a Mason valve-in-head motor with a detachable cover-plate concealing the overhead valve action and at the same time helping to quiet the motor, exclude dirt and retain oil.

The dimensions of the new four, which is a block design, are $3 \frac{5}{16} \times 4 \frac{3}{16}$. The cylinder head is a one-piece casting secured to the cylinder block by bolts making a readily removable head assembly.

Lubrication is by circulating splash and ignition by a single Simms system with hand control. The carburetor is a Zenith and the starting and lighting system an Auto-Lite 6-volt installation.

Conventional Construction

A cone clutch delivers the power to a three-speed selective gearset located amidships. Final drive is by bevel gear to a semi-floating rear axle. The tire size is $30 \times 3 \frac{1}{2}$ inches all around and the wheelbase 98 inches. The wheels are wood and the car has left drive with center control.

The body supplied with the new model is a five-passenger touring and it is fully equipped with top-windshield, speedometer, jack, pump and a full set of tools. The purchase price includes the lighting and starting system and a full set of electric lamps.

LEXINGTON'S LATEST CANTILEVER SPRUNG

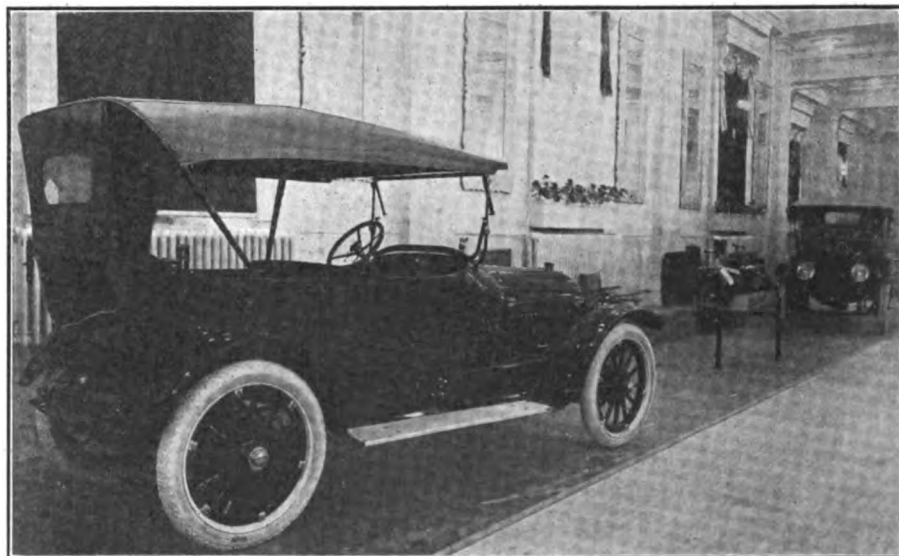
A new Lexington four appears for the first time. It is changed in several respects from the four of last season, having a long-stroke motor of the T-head type. The motor is now a Teetor, $3 \frac{7}{8} \times 5 \frac{1}{4}$, with its four cylinders cast in a block. Another point in which a change has been made is in the spring suspension, which is now cantilever instead of three-quarter elliptic. Starting, lighting and ignition is by the Westinghouse system and the wheelbase is 115 inches.

The use of vacuum feed on this model has enabled the designers to secure a more accessible arrangement of the carburetor and to shift the gasoline tank from under the front seat to the rear of the chassis. Another change in the car in the way of equipment is the fitting of a power tire pump.

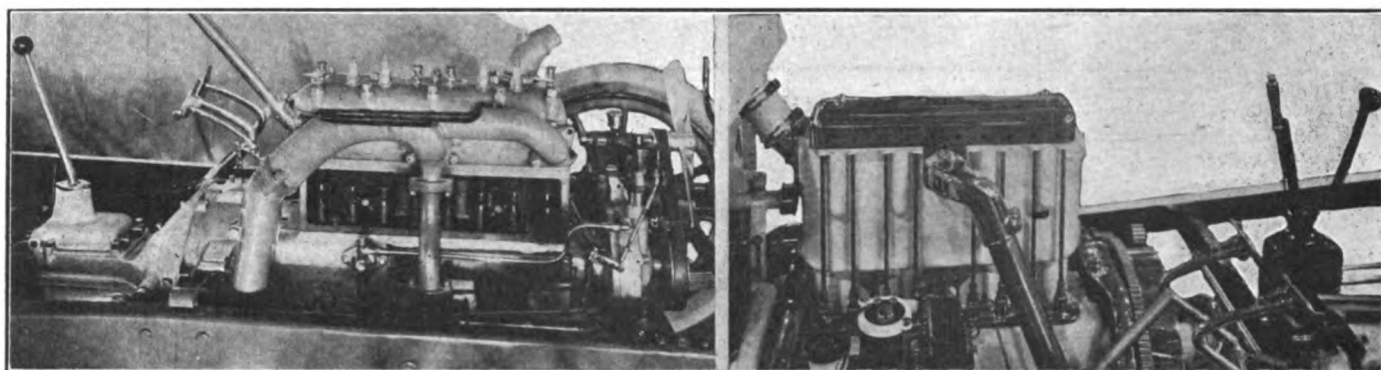
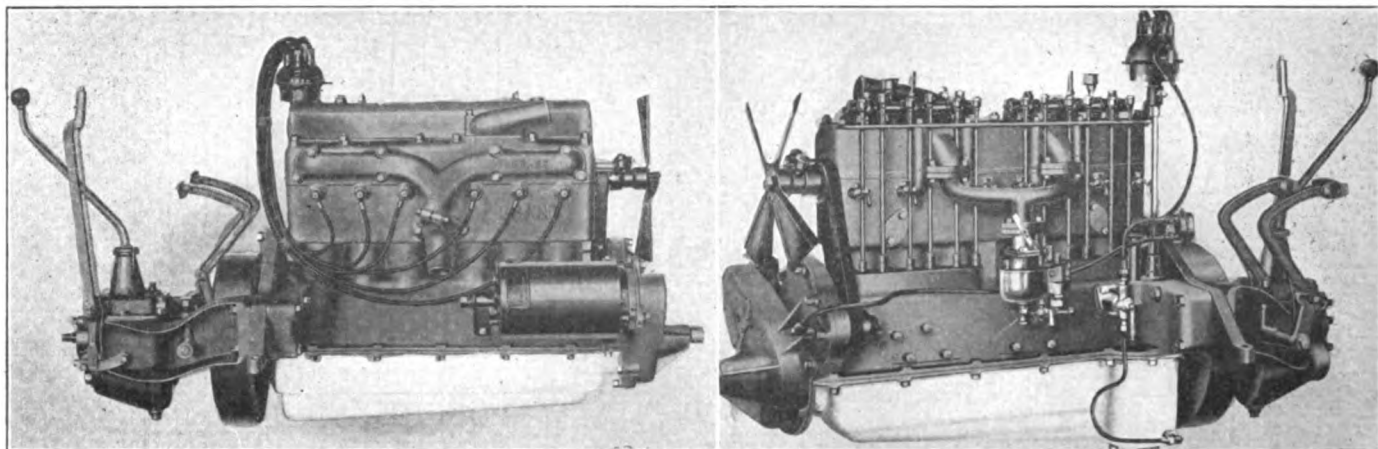
The drive is taken through a disk clutch and a three-speed gearbox. The rear axle is a bevel floating, made by the Hess company. Both sets of brakes are on the rear wheels, which are of the wood artillery type with 34×4 -inch tires.

Considerable improvement in body work and in upholstery is noticeable.

The touring car, which lists at \$1,375, is of streamline tendencies. It has a slightly sloping hood and a moulded line at the cowl which eliminates any sharp edges along the length of the body. The roadster sells for \$40 less, or \$1,335, and at the purchase price both cars include combined electric cranking, lighting and ignition. The standard color is a blue black for both the touring and roadster



The latest Jackson model has an extremely low body with straight lines; the back of the front seat is nearly flush with the body sides



SOME OF THE NEW MOTORS THAT WERE REVEALED—Upper left and right show the compact design of the Grant six, which has block cast cylinders with overhead valves. Lower left—The Dort motor has a double exhaust system. Lower right—The Inter-State motor has the modern cored-in passages, giving a clean exterior

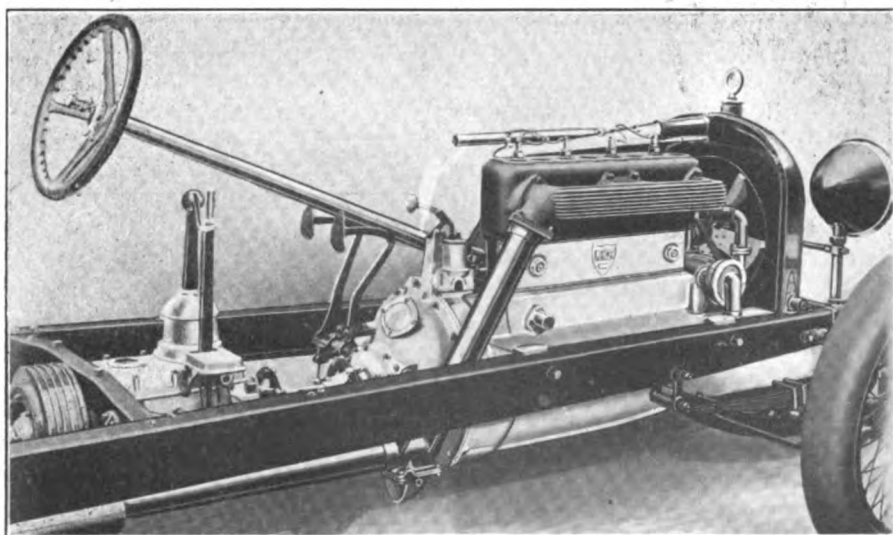
MALCOLM AT \$425 IN ROADSTER FORM ONLY

The Malcolm, a product of the Malcolm Motor Co., of Detroit, and made only in roadster form, is one of the new models to be first seen at the show. This is a light car job throughout, having an L-head block-cast motor of $2\frac{7}{8} \times 4$ dimensions with a two-bearing crankshaft. The crankshaft is exceptionally large,

having a diameter of $2\frac{1}{2}$ inches. The motor is designed for lightness and hence shows very little in the way of exterior fittings. The clean appearance is heightened by the use of thermo-syphon cooling and by enclosed valve actions with thumbscrews to hold the cover plates in position.

Ignition is by the Atwater Kent battery system and the carburetor is a Zenith. The price of \$425 is exclusive of the electric lighting and starting system,

but when this is fitted at \$70 it is an Allis-Chalmers. The clutch is a cone, and the gearbox contains a three-speed selective gearset. The wheelbase is 100 inches and the tires 28×3 . The wheels are wood, and left steering and center control is used. Both the front and rear axles are Walker-Weiss manufacture, the rear axle being semi-floating and a bevel-gear. The electrical equipment is the only option offered at an extra price as all the other equipment is included with the car. A feature is the silk mohair top.



Three-quarter view of the right side of the new Mercer chassis, showing arrangement of the components, the ribbed exhaust, the transverse magneto shaft and the propeller shaft brake

New Chase General Manager

H. T. Boulden assumed the general sales management of the Chase Motor Truck Co., Syracuse, January 4. Boulden will have entire charge of selling and in addition will look after all advertising. E. A. Kingsbury continues as secretary and treasurer, while Mr. Chase, who has had charge of sales, will devote his entire time to the manufacturing and production end of the business. Prior to Boulden's assuming the sales management of the Ohio Motor Car Co., Cincinnati, he was connected with the Reliance and Rapid trucks, but for the past two years has been vice-president and general manager of the Service Recorder Co., Cleveland.

Twelfth-Hour ACCESSORIES At New York Show

AS always has been the case in years gone by, and as it probably will be for many years to come, the first of the great National Automobile Shows which is staged this week in Grand Central Palace has revealed a wealth of things that are new in the accessory field. Many of the things that are on view have long been rightly entitled to the term staple, and as such a great proportion has already been illustrated and described in the Before-Show issue of *Motor World* for December 23. Still others will be as fully illustrated and described in the Before-Chicago Show issue, which will bear date of January 13.

The newness in the Palace is not confined to any one section, but it greets the eye on both of the floors where the makers of parts and labor-lightening devices have displayed their wares. In some cases, rumors have preceded the appearance of devices which makers have held up commodious sleeves, so to speak, and in others—not a few, by the way—genu-

ine surprises have been sprung on unsuspecting dealers. Obviously, in a review of this kind it is not possible to more than touch briefly on the newest of the new things that are first time out; more complete descriptions of many of them will appear in the Before-Chicago issue of *Motor World*.

Supplementary Spring Increase

Shock absorbers of the auxiliary or supplementary spring type show a material increase in numbers and there is no little variety apparent in the new ones which have been brought out. With scarcely any exceptions, all of the older makes, which have made names for themselves, are continued. The original type of Truffault-Hartford remains unchanged and the new type of multiple disk shock absorber, which was first revealed in the Before-Show issue of *Motor World*, makes its initial appearance. Another well-known type, which has not undergone any change, except in minor

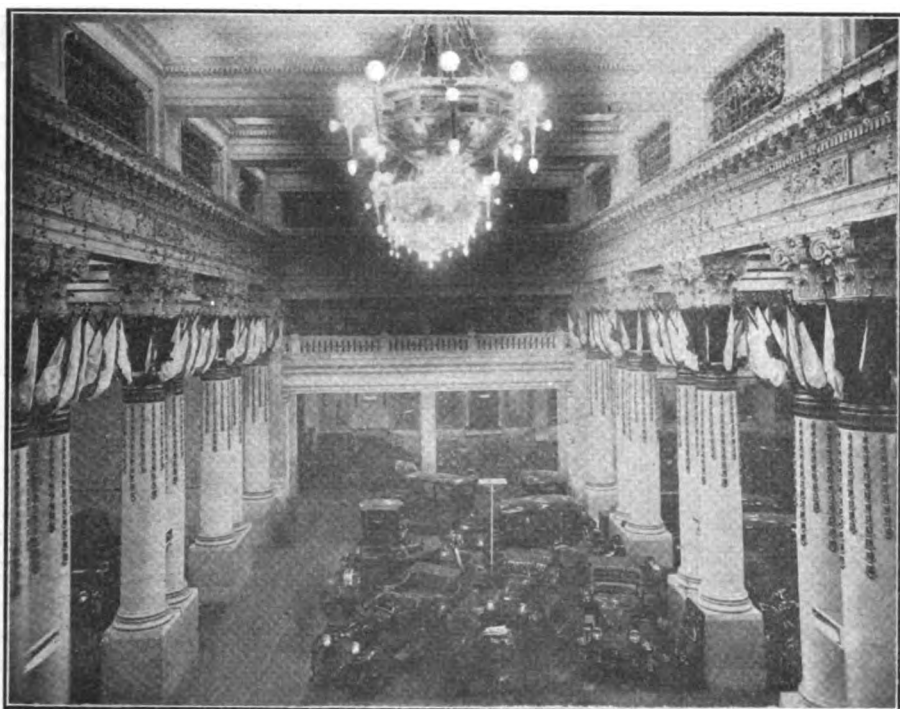
details of the invisible kind, is the Westinghouse air spring.

A great many of the better known supplementary spring devices are continued with changes which do not affect their appearance but which are designed to increase their efficiency or their wearing qualities. The J. H. Sager Co., for example, has found little room for improvement and the same may be said for the Rex, the Hassler, the U. S., the Comfort, the K-W road smoothers and a number of others. The John W. Blackledge Mfg. Co., which was among the pioneers in this field, has made a number of improvements in its Velvet shock absorbers and at the same time a new Ford type, built along the lines of the larger models and selling for \$15, has been brought out.

J-M Improves Construction

Another make of supplementary spring that has been much improved is the J-M, produced by the J-M Shock Absorber Co., Philadelphia, Pa. This device has been considerably lightened, with the result that a complete set now tips the beam at but 8 pounds. The improvements consist in the use of a pressed steel cylinder and guide housing, with fiber guides which have improved the wearing quality; at the same time a new model for Ford cars has been placed on the market.

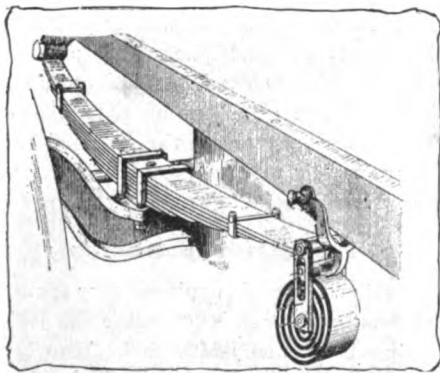
The Triple Action Spring Co., maker of Johnson shock absorbers, has lifted the curtain on three new models, one of which is designed especially for use on the new Dodge Bros. cars. It is supplied with all the necessary attachments and may be applied quickly and easily. The other two new models are intended for use on electric vehicles and commercial vehicles, respectively, and differ from the usual type in that they incorporate a third coil spring designed to come into use under the heavier loads carried by these vehicles. Among the number of other new devices of the kind there is a flat coil spring shock absorber, which may be used on any make of car.



A glimpse of the main floor where the Paige-Detroit exhibit was located, showing the general scheme of decoration, the flags and the flower decked trellis-work

at the stand of the B. & R. Shock Absorber Co., Philadelphia. The Halladay company, of Streator, Ill., is continuing its standard model with a number of improvements, including the adoption of a new tapering, flat spring. This shock absorber, by the way, is distinctive by reason of the fact that it has no sliding parts.

The speedometer field is replete with newness, several makers having brought out instruments intended for use on Ford cars and several having revised their trip-odometer mechanism to permit of resetting to any desired mileage. The Van Sicklen company has developed a new Ford instrument and also a new type of swivel joint; these instruments incorporate a novel scheme of internal illumination. Both the Corbin-Brown and the Garford companies have adopted new trip-odometer systems which permit the figures to be turned to any mileage to correspond to the mileages given in the Blue Book. Another improvement in the Corbin-Brown is that the season and

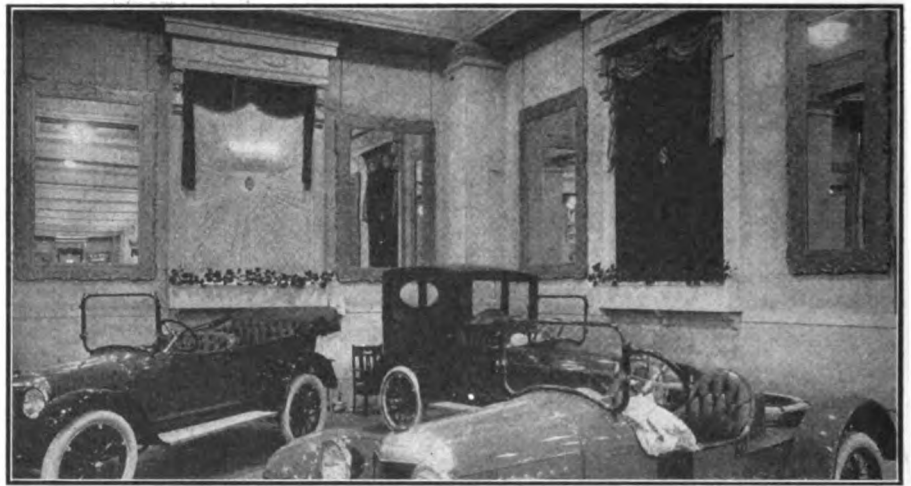


A newcomer is the B. & R. shock absorber, which has a spring of flat coiled steel

trip mileage readings now are together, leaving the dial clear and easily read. The Standard Thermometer Co. is continuing all of its regular models, as well as its Ford model, with practically no change.

An important improvement has been made in the Hoeffcker-Evans-Speedlock which, at the time of its introduction at the last show, operated to short circuit the ignition current at a predetermined maximum car speed. This instrument now has been made to operate the throttle instead and in this way to govern the speed of the vehicle. There is a Yale lock with which the mechanism can be locked. The Veeder instruments, in their score or more of types, are continued practically without change.

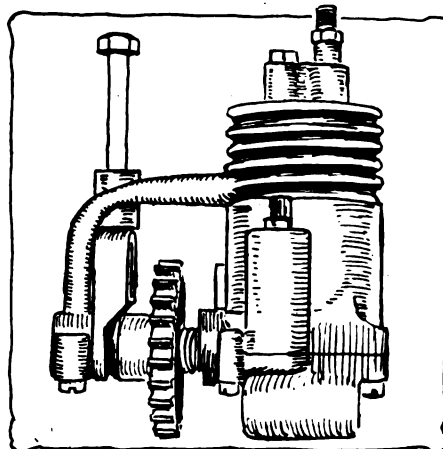
The Stewart - Warner Speedometer Corp. has introduced a number of new flush type instruments, though no changes have been made in principle or con-



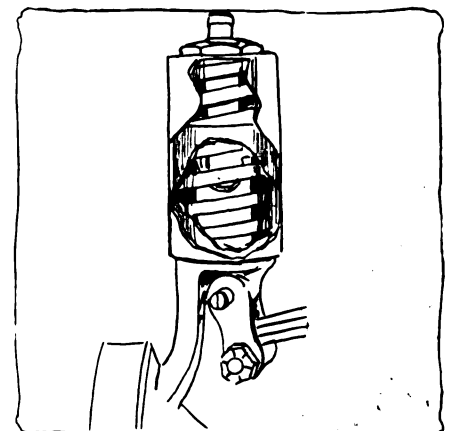
The arrangement of the cars in the Oakland space gives plenty of room to see the cars to the best advantage and without crowding

struction. One of the brand new products displayed by Stewart is an electrically wound clock which operates for one year without attention; a single dry cell, which forms part of the equipment, serves to keep a short spring

year has sprung into such prominence, as well as the single-cylinder engine-driven pump which is furnished with fittings for so many different makes of cars. At the same time, there is a new hand-operated horn which has been designed for use on commercial vehicles



The Sanford tire pump is equipped with driving gear and a neat shifter lever



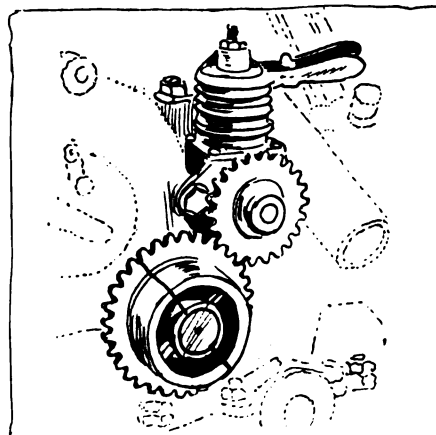
J-M shock absorbers have been much lightened and fiber inserts take the wear

wound continually. No price has been put upon this clock as yet. The Stewart company also exhibits its vacuum fuel feeding system which within the past

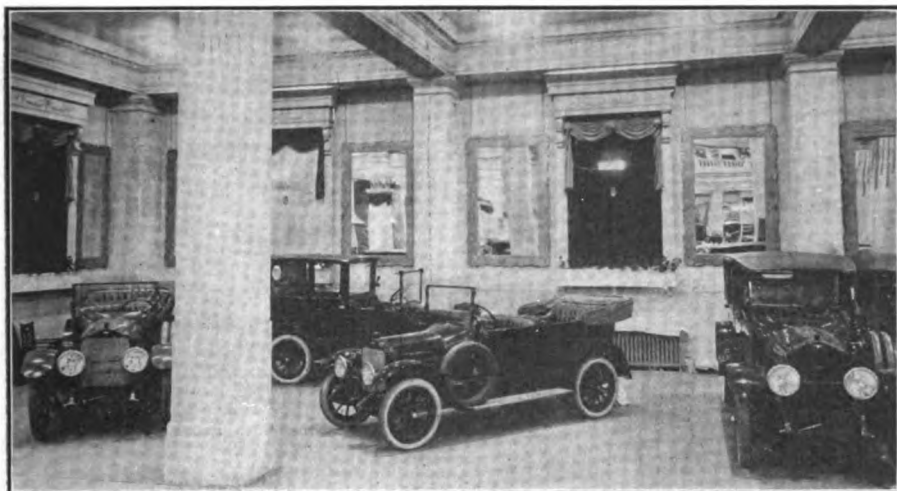
and is correspondingly heavier than the regular models.

In the realm of the engine-driven tire pump there are several new types which are more or less in the nature of surprises. The Manzel Bros. Co., for example, exhibits for the first time its new single-cylinder Ford pump, which was briefly described in Motor World last week. This pump is positively driven by gears from the crankshaft of the motor, the gears being engaged and disengaged by swinging a pivoted pump bracket. The driving gear is split and clamps over the crankshaft extension in place of the ordinary Ford fan pulley, a new pulley being integral with the gear. The pump sells for \$7.50. The new standard two-cylinder Manzel also is exhibited for the first time.

The Kellogg company, whose four-

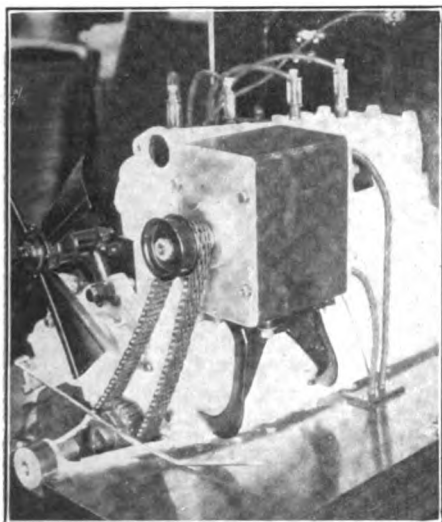


A new model Manzel engine-driven tire pump is designed especially for Fords



The White exhibit occupies a roomy corner space where the cars are seen to good advantage. Large mirrors enhance the general scheme of decoration

cylinder pumps have been long and favorably known in the industry, has brought out four new garage outfits of widely different types. There has also



The Apelco Ford starting-lighting unit is self-contained and neatly encased

been added a combination pressure gauge and air purifier. The garage pumps are of the portable and stationary types and are complete units with their motor generators. Another model, designed to be permanently mounted and driven by belt, incorporates a six-cylinder pump with water-cooled cylinders.

Among a number of other new pumps of various types the Brown Co., Syracuse, N. Y., has brought out the Sanford single-cylinder engine-driven pump, which sells for \$8.50. A new garage pump of unusual construction also has been developed; it has its four cylinders mounted around a central crankshaft, the cylinders being set at an angle of 90 degrees. The maximum pressure obtainable is 300 pounds. Another new Brown product is a gasoline vulcanizer, which is not unlike a soldering iron in prin-

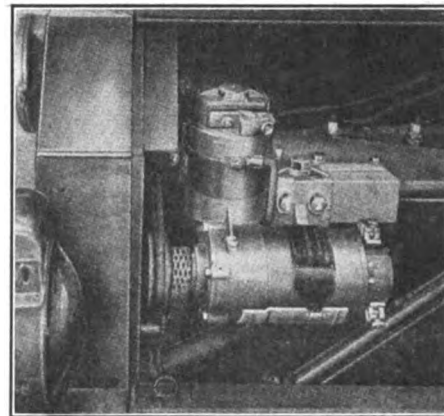
ciple. The vulcanizer proper is placed in a gasoline firepot and after a charge of gasoline has burned itself out the vulcanizer is hot enough to be applied to the work and will retain its heat until the job is finished.

The electric lighting and starting field has been considerably enlarged by the addition of quite a number of systems designed especially for Ford cars. The Gray & Davis Co. exhibits its original Ford system and in addition has a brand new single-unit system which is revealed for the first time. Both Dyneto and the General Electric Co., the latter under the style Genemotor, have brought out Ford systems, and the Kemco line, which originally embraced only a fan type generator, which later was supplemented by a Ford lighting and starting system, now includes a complete line of several sizes of generators for starting motors.

Another newcomer in the Ford electric lighting and starting class is the Splitdorf-Apelco, an unusually compact single unit connected through a combination of belt from the fan pulley and silent chain from the crankshaft. The Brown-Lipe Co. is exhibiting a new type of

apparatus which is incorporated directly with one of its gearsets. The newest thing in the North East line is what is styled a universal application by means of which the North East system can be fitted quickly and easily to practically any used car.

Closely allied to lighting and starting, the ignition field of the industry is well represented. The Bosch Magneto Co. has the largest single accessory exhibit at the show and it goes without saying that every unit of its extensive line is displayed. These include all of its standard magnetos, as well as both of its electric lighting and starting systems, the latter being displayed on two complete chassis, and the two new types of Ford systems, of which the gear-driven apparatus, incorporating the new NU4 magneto, is the later. The Westinghouse company, which since the first of the year, has grouped all of its automobile business into a separate department, is displaying its complete line of several types of lighting and starting systems and other accessories as well as a new



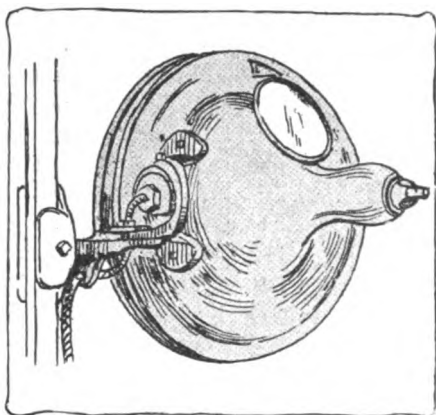
Hartford Ford starting-lighting system with vertical high-speed motor and worm drive

separate battery ignition system, which combines a timer and distributor in a single unit.

The K-W company, which was one of the pioneers in the Ford ignition system



On one of the main aisles is the Marmon exhibit with a new touring car up at the front and set to give a slightly quartering view of its streamline body



Newtype lamp with universal swivel bracket and concentrating mirror on back

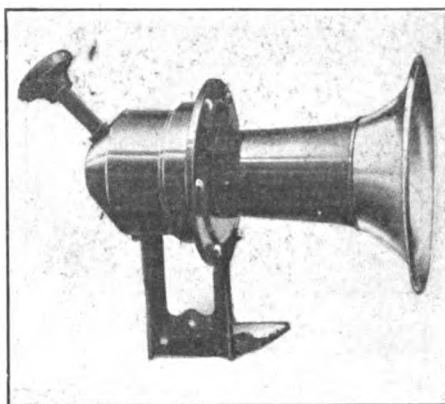
field, is exhibiting its Master vibrators, which have undergone very little change. The Halladay company has brought out a new Ford unit coil system, which operates in somewhat the same manner, and also has revealed, among other things, a new type of Ford steering wheel which may be tilted upward to permit easy entrance to the driver's seat. Also there is a new windshield ventilator, which permits a Ford shield to be shifted slightly forward at the bottom to give ventilation; this sells for 75 cents in black and may be used on any car which has a straight dash.

The old-line carburetor makers, such as Stromberg, Rayfield, Schebler and Holley, are out in force, all of them exhibiting the new types which already have been illustrated and described in the Before-Show issue of Motor World. In addition there are a number of new instruments. There is the Parkin, for example, which is produced by the Light Mfg. & Foundry Co., and which is distinctive by reason of the use of an unusual cylindrical throttle and the complete absence of springs. The Shakespeare, which has been developed by William Shakespeare, is another new one which is devoid of springs, the needle valve being moved by suction through interconnection with the air valve. The Floatless Carburetor Co. exhibits the M-F carburetor which, as the name of the company indicates, is minus the usual float.

There is not a very great deal that is new in warning signals. The complete Klaxon line, with its new prices, is well displayed, as are the Newton and Spar-ton line, which also are distinguished by a number of new prices. A noteworthy improvement has been made in the Newton Handphone and its price has been reduced from \$7.50 to \$6. The number of parts has been considerably reduced by making the plunger bar and rack in one piece instead of having them separate; also the plunger no longer projects be-

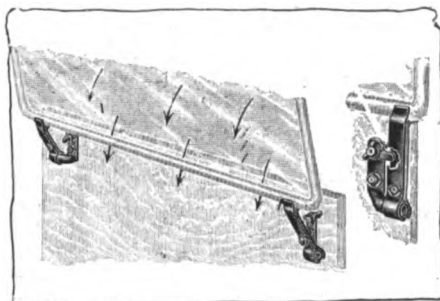
low the casing, and the spring is placed above instead of below.

The Garford company, Elyria, O., has added to its line of electric horns a brand new hand-operated signal which differs from everything else of its kind.



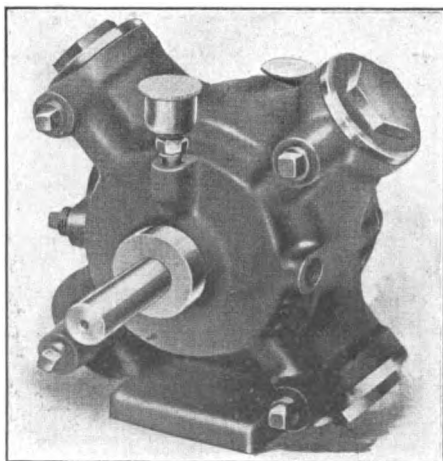
One of the latest Garford hand horns, which has sprocket and chain drive

Instead of the usual train of gears between the lever and the diaphragm operating mechanism there is a short chain. The horn is unusually compact, another point of difference being that the plunger

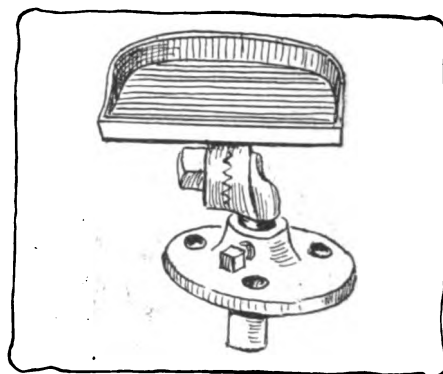


A Halladay attachment which permits Ford windshields to be shifted for ventilation

protrudes from the case at an angle pointing backwards. It is made in several sizes, one size listing at \$4.25. Another new horn of the electro-magnetic type is the Benjamin; this is unusual in



The Brown garage tire pump has four cylinders radiating from the crankcase



An adjustable heel rest is a convenience shown by the Auto Pedal Pad Co.

that the magnet cores are parallel with the diaphragm, which is unpunctured.

The makers of jacks are well represented and there is generally a crowd of the curious gathered at the booth of the Autorescue Mfg. Co., where is displayed a new device intended to assist crippled cars to the repair-shop. It is designed to take the place of one of the wheels and will fit practically any car on the market. Another jack which never fails to attract attention is the Excel, which is a very heavy piece of mechanism intended entirely for garage use where sturdiness and genuine utility are prime requisites. The Weaver company has brought out what it styles the Weaver Twins, and the Jiffy Jax is a new product with a cylindrical barrel which is exhibited by Ralph Walcott.

The tire section is interesting by reason of the many new things it holds. The Braender Rubber & Tire Co. is exhibiting a new type of non-skid casing which is distinctive for its U-shaped tread depressions and differs from the usual Braender non-skid in that it incorporates cord-like reinforcements designed to increase traction and wear resisting qualities. The Dayton airless tires, which now have been on the market for about eight years, have been supplemented by a new pneumatic tire casing which has a non-skid tread of conventional form and is guaranteed to give 5,000 miles service. Gordon tires, which have been on the market for nearly a year, are exhibited for the first time and are distinguished by a novel type of triangular non-skid tread.

The Dujardin Rubber Co. is exhibiting its Economy tube, which is guaranteed to be proof against blow-outs and all forms of rim cutting. This tube has the usual gum foundation and is reinforced by a stocking of Sea Island cotton. To demonstrate the strength of the construction one of these tubes is exhibited in a casing liberally cut and pumped to 85 pounds pressure. The Steel Pneumatic

Tube & Tire Co. is exhibiting an unusual tube which is not only guaranteed to be puncture proof but which is self-inflating; it incorporates a number of miniature plungers and pumps which take the load and compensate for deflation; it is guaranteed for a year.

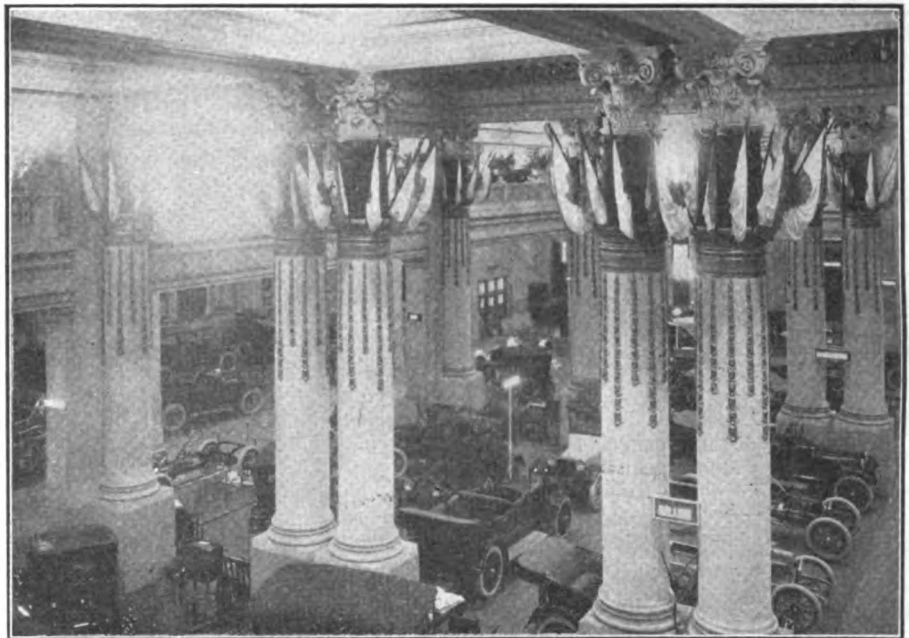
Among the other new things which are to be found in the tire section there is a Marathon casing with a new angle non-skid tread, the Mussinan tire which is built upon a new principle that carries the load upon an arch; a new Double Fabric tube, which is composed of alternate layers of red and gray gum; a new Double Fabric hook-on boot and a line of vulcanizing supplies which are displayed for the first time; a new Sterling solid tire with a serpentine tread from the Rutherford Rubber Co., as well as a new Ford casing which is guaranteed for 5,000 miles.

The Ashley Wire Wheel & Rim Co. is exhibiting the first example of a new cord tire it is preparing shortly to place on the market. This company also is showing an inner tube designed especially for use with wire wheels and having a reinforced upper surface for protection against possible damage from spokes. The Brown puncture-proof tube, which is guaranteed to be self-healing in the event of puncture, is exhibited by Story & Reed in its original form.

Spark Plugs Much in Evidence

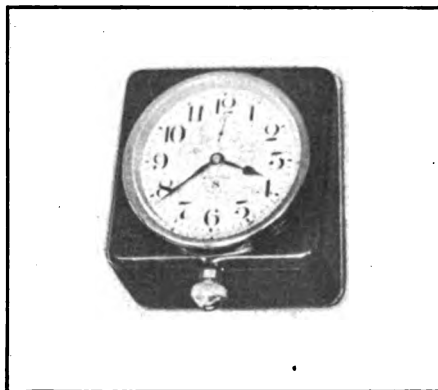
The makers of spark plugs collectively have brought out quite a few new styles with such staples as Champion—which also has a new priming plug—Bosch, Bethlehem and a host of others very much in evidence. The Emil Grossmann Co. has brought out several new styles of Red Heads, including a new priming plug, and is exhibiting for the first time its new Onepiece plug. The Superior Specialty Co. has brought out a new type in its Su-Dig, a series plug with double electrodes, and Chas. E. Miller has added a new low-priced plug with blue steel shell which sells for 50 cents. Also, the Benford Co. has a new plug with a long shank designed especially for Overland cars. The Mosler Spit-fire family is complete, including the handy breech-block type.

That those who ride in roadster models may have the protection and the convenience of those who ride in touring cars, the Golde company has added a roadster top which is much the same as their regular model except that it is smaller. The Holden company and the Perkins-Campbell company both have added one-man tops suitable for use on Fords, and the Pantasote company's Sol-



View of part of the main floor, showing the decorations, which are of uniform character, and giving a good idea of the arrangement of some of the cars

itaire tops are continued with few changes. The Perkins-Campbell company is featuring a new type of detach-



The Waltham special truck model clock cannot be set without using a special key

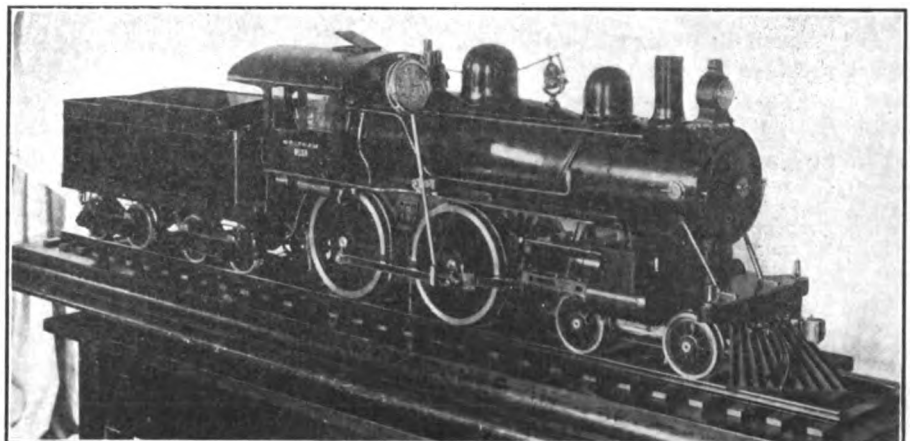
able upholstery for Ford cars which always draws a crowd.

Devices for dimming the brilliancy of headlamps for city driving are fairly

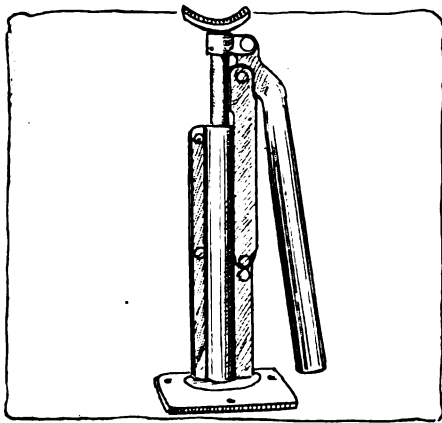
numerous and among them may be found a new device styled the Osborne which deflects rather than dims the lamp rays. This is a glass lens built partly on the fresnel idea, which takes the place of the usual lens. In the Hampton glare removing lamps, a small centrally located tube acts as a concentrating medium to send diverging rays forward.

Bumper Builders Show Novel Ideas

The J. H. Sager company, which long has been known for its bumpers among other things, has developed two new types which are displayed for the first time. These are of the modified channel type and there is a clever means of fastening them in place with set-screws. There is no need for drilling the frame or otherwise mutilating the chassis. The Grossmann company also has a new bumper for Ford cars, the feature of which is a telescoping spring attachment.



A Waltham watch is kept constantly jolting on the end of a rod attached to the wheel of a model locomotive which runs merrily on compressed air



The Jiffy Jax are new models and are distinguished by their cylindrical barrels

In one of the sections where clocks are displayed the Waltham company has a novel exhibit which never fails to attract attention. It is a miniature locomotive which is true to life down to the last screw. Compressed air furnishes the motive power. The purpose of the model is to demonstrate that Waltham automobile clocks will withstand a really astonishing amount of shaking up without affecting their value as timepieces. There is a Waltham watch carried in a standard attached to one of the side rods and it is continuously jerked backward and forward. In addition to this display the Waltham has its complete line of timepieces on view, as well as a new clock for trucks which is weather and thief-proof and which cannot even be set without the proper key.

Tonneau Windshields and a New Rim

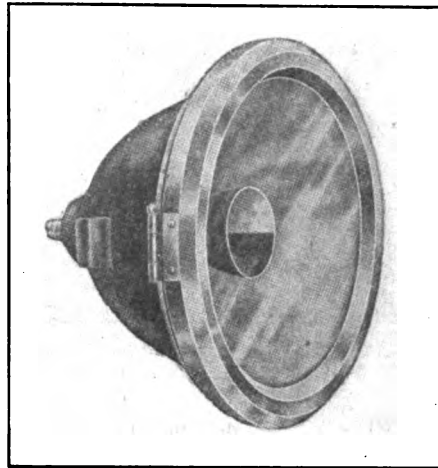
Windshields have become fairly well standardized and there is not a great deal that is new with the exception of two tonneau shields which are displayed. One of these is the Fryer-Austin and the other is the J-H, made by the Mutual Auto Accessories Co., New York, and both attach to the back of the front seat for the protection of tonneau passengers. Both are adjustable through a wide range.

The Standard Woven Fabric Co., which produces Multibestos brake lining, has a novel exhibit consisting of a cabinet for holding several reels of lining of different widths and thicknesses. Each reel is plainly marked in white in foot lengths, thus making it simple for the dealer to measure off any desired quantity.

The Standard Welding Co. has brought out a new type of rim which is unique. It differs from every other rim in that the side flanges remain permanently on the casing to which they are attached.

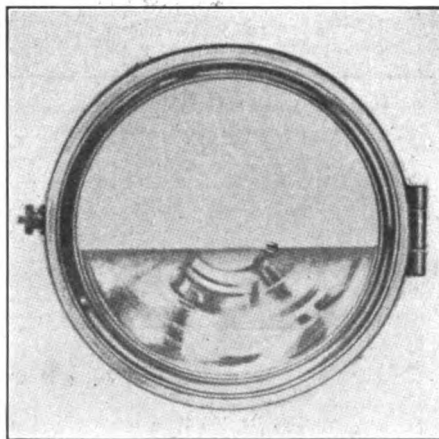
Throughout the whole of the accessory display it scarcely is possible to turn

around without almost colliding with something that is new. At the exhibit of the Rose Mfg. Co. there is a new garage heater which operates on kerosene, two gallons being sufficient for 48 hours; a new rod license clamp which may be used to fasten almost kind of a license plate is new; there is also a new electric tail lamp which sells for \$2 including the switch.



The Hampton glareless lamp collects stray rays and shoots them straight ahead

The New Era Spring & Specialty Co., Detroit, Mich., has a booth full of newness, not the least important of the many devices being a new Ford license plate, tail lamp and tire holder, which is designed to hold the tires without chafing and to prevent the exhaust gases coming in contact with them.



H-H headlight ray controller shades the part of the lamp that dazzles

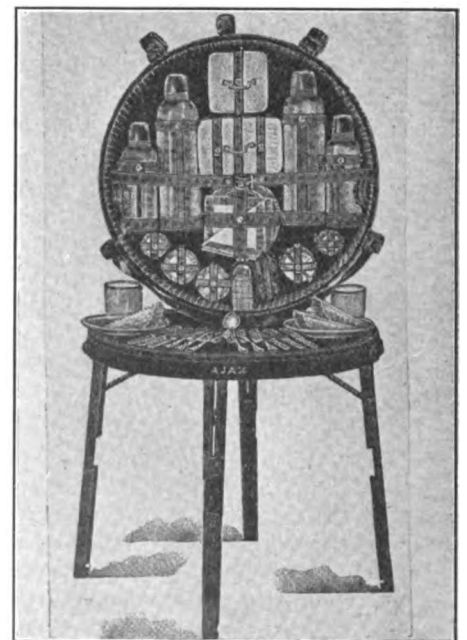
The Auto Pedal Pad Co. has a couple of ingenious valve grinding tools, one for Ford cars, in which there is a handle which converts a continuous rotary movement into a turn in one direction and one in the other automatically. The Ford set has a special bit and sells for \$2, the other model having several different sized bits and selling for \$2.50.

This company also has an ingenious adjustable heel rest and a valve lifter which operates through a toggle mechanism.

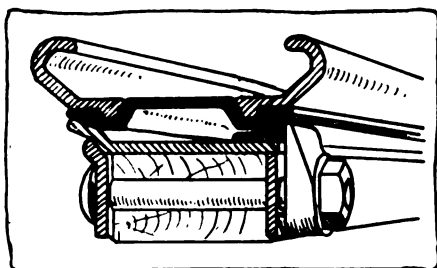
The Wood Mfg. Co., Fairfield, Conn., has ingeniously combined a hand searchlight and a mirror, and Asche & Co. has a new type of inspection lamp which is mounted atop a single cell of dry battery which operates it. A novel lock for Ford cars which short circuits the magneto has been brought out by the Garage Equipment Mfg. Co. among a number of other novelties, including a combination tail lamp, license bracket and tire holder for Fords. A complete luncheon set, including all the necessary utensils for six persons, is shown by the Berg Auto Trunk & Specialty Co., New York. This may be set up in the tonneau of a car if desired, and incorporates a patented idea for holding Thermos bottles, which prevents them being jarred and broken.

Another Ford Starting-Lighting Set

The electric lighting and starting system which has been developed by the Hartford Suspension Co., Jersey City, also is shown for the first time. This consists of separate unit generator and motor mounted together, the motor being of the exceptionally high-speed type, like other Hartford motors, and being on end. The motor operates at about 10,000 r. p. m. and cranks the Ford motor at 300 r. p. m. The two units are connected to the motor by means of a silent chain, which with all the other necessary fittings, bracket, etc., are furnished. The price of the system, including a 50-ampere-hour battery, is \$100.



The Berg luncheon outfit for six persons folds into a compact circular case



In the new Stanweld rim the side rings are permanently attached to the tire

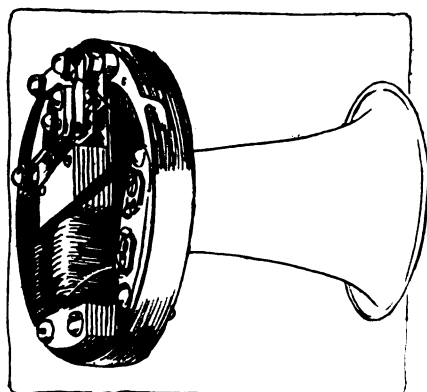
The Chicago Automatic Machine Co., Chicago, has brought out a unique combination of starting crank and tire pump which is designed to replace the ordinary starting crank on any car. The pump is a single-cylinder machine with the cylinder forming the crank. It is operated from the crankshaft through a dog clutch. In the Ford size it sells for \$10 and for larger cars it costs \$12.

The Clincher Tire Plow Co., New York, has an ingenious device for removing clincher tires. This is an iron which fits under the bead and is long enough to rest firmly on the roadway. With the wheel jacked up and the tool in position the wheel is revolved, thus "plowing" the tire off.

Stewart & Co., New York, has a number of useful devices on view, including a lever valve remover for Ford cars which is simplicity itself, an adjustable Ford wheel puller, a screw-operated spring leaf separator, an emergency brake pawl release handle which will hold the lever in any position, a starting crank holder which is rattle-proof, and a muffler cut-out which is easily clamped in position.

Atwater Kent Ford System.

The Atwater Kent Mfg. Works, Philadelphia, has developed a Ford battery ignition system which is shown for the first time. The principle is that of the standard unisparker; the unit is mounted on a vertical shaft and below it, in the same housing, is an automatic spark governor.



The new Benjamin magnetic horn has its mechanism laid flat over the diaphragm

The outfit is also supplied, when desired, without the governor. The price of the outfit with governor, dash coil and kick switch, is \$30; without the governor, \$24. Either system with plate switch coil instead of kick switch coil, \$2 less. Installation is easily effected without alterations and without machine work and does not require a mechanic.

New Westinghouse System

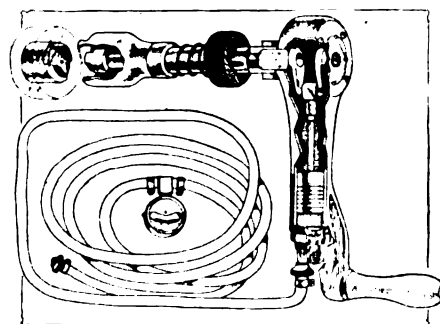
A battery ignition set in which the interrupter coil, condenser and distributor are contained in a single vertical unit is one of the latest products of the Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa. The body of the unit is cylindrical and of Bakelized Micarta. The interrupter is at the bottom, has a circuit breaker of the standard Westinghouse type and can be easily removed for inspection. The coil is embedded in insulating material. The distributor, which forms the top of the unit has a wiping brush contact of the same type as that used on the ignition generators. The unit is designed to be driven by gearing from the pump or magneto shaft and operates equally well in either direction. The source of current may be a storage battery or plain lighting generator. A detail of the system that is of advantage in some cases is that the vertical shaft can rotate backwards about 48 degrees without moving the circuit breaker cam and causing a backfire which might endanger the operator.

Centrifugal force plays no part in the operation of the breaker of the U-H magneto shown by the U-H Magneto Co., New York, the reason being that the moving contact operates in an axial direction, and is located at the center of rotation. The points are adjusted by turning a small hexagon nut directly in line with the end of the armature shaft.

The slip-ring is located directly under the distributor. All parts are extremely easy of access and the magneto is water-proof. The pole pieces are of peculiar form, and are designed to give a spark of equal intensity at full retard, full advance or intermediate position. An automatic spark advance may be installed in an extension of the breaker housing. Another attachment of the spring type gives a rapid motion to the armature when the motor is cranked slowly in starting.

Prices range from \$48 to \$110 for four cylinder types, the latter including automatic starting device; and the six cylinder models cost \$65 and \$80 for small and large motors respectively.

The advantages of two bodies, one for summer and the other for winter are combined in the convertible body shown by the Springfield Metal Body Co., Springfield,

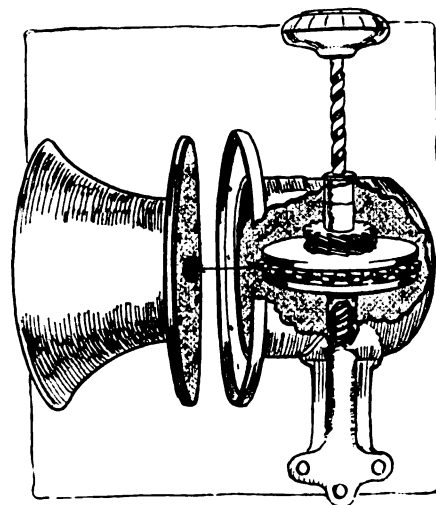


Chicago Automatic Machine Co.'s combined starting crank and engine-driven tire pump

field, Mass. For summer service the top is folded back, and the windows dropped into pockets, while for cold weather, the top and windows together with their frames are raised, fully enclosing the car. The curtain or window can be placed back of the driver's seat if desired. These bodies are made for all types of cars, and the makers state that the increase of weight is so slight as to require no alterations in the spring suspension.

Novel Hand Horn

A last minute surprise in the shape of a new horn mechanism was sprung by the Heinze Electric Co., Lowell, Mass. The chief peculiarity is that instead of the usual toothed wheel, the rotor carries on its edge a series of loosely mounted strikers which are thrown out by centrifugal force against the button in the center of the diaphragm. The strikers have a movement of about $\frac{1}{8}$ inch so that no adjustment is required, and none is provided. The rotor in the hand type is operated by a vertical spiral rod through a dog clutch, which is positive; no ratchet is used, the clutch disengaging when the handle is released. The price of the horn with either long or short projector is \$4. A motor-driven horn, operating on the same principle, sells for \$15, and the smaller motor horn for \$7.50.



The Heinze horn has no gears and floating strikers take the place of teeth

LETTERS FROM READERS

Editor Motor World:

Several press reports regarding our recent fire have been somewhat confused, and, as many of your readers will be interested, we shall be glad if you will give space to the following statement:

Our inventory at the time of the fire amounted to \$107,000 or \$108,000. We had insurance amounting to \$92,500 and saved most of our office equipment, valued at \$5,000 or \$6,000. The salvage will amount to about \$6,000 or \$7,000, so that almost our entire loss was a business loss resulting from the time necessary to get into new quarters and get a new stock.

At the present time we are filling all orders for everything except Elco brand goods. Staple merchandise which can be bought in the city we are picking up, and quantity orders are being shipped from the factory direct to the customer.

Just as soon as we can get a satisfactory building we expect to resume our wholesale business on a better basis, and under more favorable conditions than ever before. We do not expect to re-enter the retail business, but our present plans contemplate an exclusively wholesale business. Our stock will be absolutely new throughout, as all the salvage will be closed out through other channels.

Yours truly,

Elyea-Austell Co., A. H. Bailey,
Atlanta, Ga.

Engineer vs. Salesman

Editor Motor World:

In your December 23, 1914, issue, under "Time At The Show Is Important," your article regarding salesmen reads as follows: "He must instinctively feel that this man asking so many mechanical questions is an engineer or draftsman for a factory. At every show there are hundreds of these men floating around."

Yes, you can wager we are there and on the job for that purpose. I think an automobile show is the place for engineers to go to get ideas for his firm. In fact, most every automobile company in the United States is certain to send their "Engineer" to at least one show a season for this purpose. You can readily see that "Engineers" have produced cars which can readily be sold at a much lower price, whereas if the salesman of average ability had designed it, there would not be the advancement along this line.

I also note that a dealer said, "One of the best things a dealer can do in order

to get results from a show is to see that his salesmen are 'fresh' and 'peppery.'" That may do for some kind of salesmen, even some kind of automobile salesmen, according to the kind of a car or cars which they are selling.

Recently a salesman was showing a prospect through the axle assembly department of a rather large automobile factory, and the prospect noticed a man shellacking an axle cover on the case. He asked the salesman why that was done and he replied, "To make an airtight case so that the pressure of the gears would force oil up the propeller shaft and out to the wheel hubs." Another prospect asked a good salesman what the sheet metal cover was under the motor for, and the kind salesman answered by saying that if driving on wet streets the water would splash on the cylinders and crack them.

A couple of very fine remarks for a salesman! I think what we need most in the selling end is men who are mechanics as well as having the gift of gab. Recently I asked a salesman approximately what percentage of clearance his motor had and he said, "About 75 per cent." I said "Fine! Good work!" I think we engineers still have a little on the automobile salesmen.

Yours very truly,

A. L. Neal,
Engineering Department,
Peerless Motor Car Co., Cleveland, O.

Philadelphia Truck Club Reelects

At the annual meeting of the Motor Truck Association of Philadelphia, these officers were reelected: President, E. B. Jackson; vice-president, E. S. Hare; treasurer, J. D. Howley; secretary, W. H. Metcalf.

Maxwell Issues Parts Book

The Dealer's Master Parts Price List is the title of a 416-page book recently issued by the Maxwell Motor Sales Corp., New Castle, Ind., the object of which is to furnish 1,915 Maxwell dealers with the price of the parts for Brush, Columbia, Courier, Maxwell-Briscoe and Stoddard-Dayton cars, 164 models all told.

To make the catalog easy to handle and to read, the six divisions of the book, each of which concerns the models of one make, are printed upon paper of different color. Suggestions and instructions are given so that dealers when

ordering parts may save their time and money.

Ford Wins Suit to Protect Name

A final injunction has been issued by Judge Landis, Chicago, against Fred Buck, in business as the Barry Sales Co., in a suit brought by the Ford Motor Co., restraining the defendants from using the Ford name and trade-mark in any way and from representing that any relation exists between them and the Detroit factory. The Ford company complained that the defendants had a Ford sign and trade-mark on their building when they had no right to do it, the company not being a Ford dealer but buying cars from other dealers. The case was in the U. S. district court for the Northern district of Illinois, Eastern section.

Distributing Christmas Money

Distributions of employees' participations and Christmas gifts is a principal topic of interest at present in several Detroit factories, among them the King, Ford and Federal truck.

The King Motor Car Co. will distribute about 10 per cent of its total profits for the year 1914 among all its employees some time in January. About 200 men and women will share in the profits, as was the case in January, 1914, when 10 per cent of the profits made in 1913 were given all those connected with the company who are not stockholders. The share of each employee is based upon his annual salary.

The Ford Motor Co. has distributed a part of its annual profits as a Christmas present among 200 to 300 heads of departments, general foremen, factory heads, old employees, not only in the plant in Detroit, but in the various assembling plants and branches.

The Federal Motor Truck Co. gave its employees, 150 to 200 in number, for Christmas a deposit in a savings bank, representing 10 per cent of their wages for the year. The gift was appreciated by the employees. The reason of the Federal company for having the money placed to the credit of each employee was to instil further the saving habit.

Puts "Aluminum" In Name

To better designate the nature of the business under a new manufacturing policy, the Western Iron Works, Manitowoc, Wis., has changed its name to Grimm Aluminum Castings Co. The entire plant is being overhauled and new equipment installed, and in the future only aluminum castings will be produced.

Overhead Valves in New Ferro Eight

Two Sizes, Identical in Design—Removable Heads

An eight-cylinder motor with valves in the head has been brought out by the Ferro Machine & Foundry Co., Cleveland, O., and it is exhibited at the Biltmore Hotel, New York city. This is the first time this construction has been used in a commercial eight-cylinder motor. Many other interesting features are also noticeable in this machine, which is built in two models, rated at 45 and 60 horsepower, the former having a 3 x 3½ bore and stroke and the latter 3¼ x 4.

Except for the difference in size the two engines are identical, both cylinder blocks and the top half of the crankcase being cast in one piece with the valves in detachable heads. The rocker mechanism is completely enclosed in caps which are bolted to the heads.

Extreme accessibility has been obtained in this motor by the valve-in-head construction, which allows the exhaust pipes to be carried on the outside of the cylinder blocks. The intake manifold also incorporates the water outlet from the cylinders and in this way one pipe is made to do the work of two. The thermo-siphon system is used. Further simplification has been obtained by driving the generator and two-bladed fan by a single 2-inch belt, the generator, of course, being mounted directly back of the fan between the Vs. The starting

motor is placed at the rear end between the cylinders, and drives through the flywheel. Between these two electrical units is the timer-distributor, which may be any standard make.

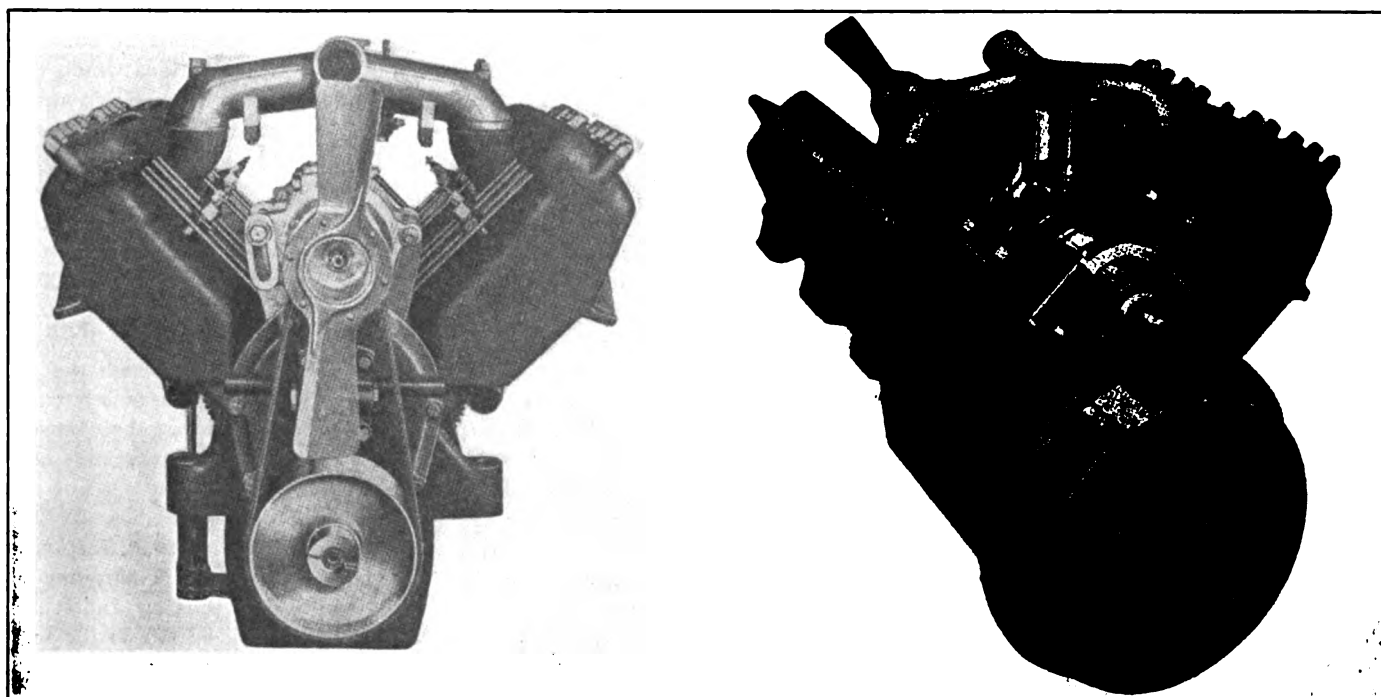
Many details of this motor are new. For example, the cover which encloses the valves is bolted tight so that it is noise-proof and dust-proof and retains the oil. It gives the impression that it is an integral part of the cylinder castings. These cover plates are held by three studs. The valves are operated by pressed steel rocker arms, which are an innovation. Roughly these are of channel shape. Another feature is in the pivoting of these rocker arms. Instead of using a pin, a ball and socket joint construction is employed. The ball is formed on the end of a stud which is bolted to the valve cover plate and the socket is pressed into the rocker. The studs are hollow and are equipped with ball-closed oil holes, thus the ball joints can be easily oiled. The studs are adjustable, so that the proper clearance between the ends of the rocker arm and the valve stem and push rod can be maintained.

A single camshaft with 16 cams is used. It is driven by a pair of large helical gears direct from the crankshaft. By the use of a cam for each valve the necessity for the use of valve levers is eliminated; roller cam followers are used. It is stated that with the 16 cam construction this motor is as easy to time as a four and no difficulty should be experienced by repairmen.

The cylinder head is held by eight bolts, four on each side. As already stated, the intake manifold and water outlet pipe are combined in a single aluminum casting, the intake passage being inside of the water passage. This insures good vaporization, as the walls of the manifold are always at a high temperature. The manifolds slope from the center towards both blocks so that any liquid fuel which is carried from the carbureter does not tend to collect but flows into the cylinders. The outlet water connection is at the center of the casting on the outside. The exhaust pipes are on the outside of the castings, there being three outlets from each cylinder, individual outlets from the end ones and one outlet for the center cylinders.

The pistons are fitted with three rings, two near the top to hold the compression and a larger ring around the wrist pin which has a double function, to retain the wrist pin and to prevent it from scoring the cylinders and to hold compression. The connecting rods are of the forked type, there being one connecting rod bearing for two connecting rods. The crankshaft and camshaft are carried on three main bearings of phosphor bronze.

Lubrication is by a force-feed system, there being a gear pump at the front of the motor on the left side which draws oil from the bottom of the crankcase and forces it through four oil leads to the main bearings, from whence the oil is distributed from the connecting rod bearings to drilled leads in the crankshaft.



Opposite ends of the block Ferro eight-cylinder motor, in which extreme accessibility is obtained by a clever valve-in-head design. Intake manifold and water outlet are combined in a single aluminum casting; the water outlet is at the center

STEVENS-DURYEA STOPS MANUFACTURE OF CARS

**Notifies Representatives Production Has
Been Suspended—Chooses This as
the Best Way Out of
Situation**

The Stevens-Duryea Automobile Co., Chicopee Falls, Mass., has notified all of its selling representatives that owing to the financial depression and general uncertainty of business the further manufacture of Stevens-Duryea cars and the bringing out of new models has been definitely postponed. The company has on hand spare parts of the value of \$1,500,000 for the 14,000 Stevens-Duryea cars now in use and will continue the manufacture of spare parts to meet all requirements.

The Stevens-Duryea Co. is entirely free from debt and owns two factories, both of which are free of incumbrances. One is a new plant, completed three years ago and located in East Springfield, and the other is the old plant of the company in Chicopee Falls.

It was known early last fall that the Stevens-Duryea company was in need of ready cash to the extent of approximately \$700,000. At that time it was possible to secure this amount under certain conditions, but Frank Duryea, who owns the controlling interest in the business, preferred not to take the new capital under the conditions specified.

The exhibit space at the Grand Central Palace allotted to the Stevens-Duryea Co. remains empty. The feeling is general that a close-down of this nature may eventually mean the elimination of the company from the field of motor car manufacture. It may be that the company prefers to stop now with a surplus on hand in preference to continuing the business, diminish this surplus and lose money. When running full time the company employed 2,500 men at the main factory and several hundred at the East Springfield branch. Of these, only a few remain. The shut-down is a serious blow to Chicopee Falls and there is talk of prominent men in Springfield using their influence to get the plant started again.

A. G. Spaulding & Bros., New York city, who for 10 years held the retail sales of Stevens-Duryea cars for New York, Philadelphia and Newark, N. J., notified the Stevens-Duryea Co. September 1, 1914, that they were going to withdraw from the motor car business. Frank

Eveland, who has been in charge of the New York branch since its inception, expects to close the business up at the earliest moment and to continue in the industry. Last fall he closed the Philadelphia Stevens-Duryea branch as well as that in Newark. Eveland is one of the pioneers in the motor industry, having been associated with it for 17 years.

Twombly to Build Own Cabs

The Twombly 20-cents-a-mile, two-passenger taxicab, which it had been planned would be placed in service January 1 in New York city by a large cab company, will not appear on the streets until March 15 and then under the management of W. Irving Twombly, the maker.

He has formed the Twombly Taxicab Co. with \$300,000 capitalization under New York laws and is preparing to build 500 cabs. About 25 of these will be ready for service March 15. He has also added a cab which will carry four passengers and will build on the proportion of 80 per cent two-passenger and 20 per cent four-passenger, this, he states, having been found to be the average ratio in taxicab service. The rates will be: Two passengers, 25 cents the first mile and 5 cents a quarter thereafter. Four passengers, 30 cents the first mile and 7 cents a quarter thereafter.

Chamber Plans Kardo Defense

Part of the defense conducted by the National Automobile Chamber of Commerce in the axle suit, Kardo vs. Studebaker, will be based upon an axle patent or patents issued 15 years ago to Leo Melanowski, of the engineering department of the White Co. The patent will be cited as priority, but details of the defense are not divulged by the Chamber. The Melanowski patent is said to incorporate many of the features included in the Kardo patents.

Long Electrical Horn; Prices Revised

An electrically operated horn, which embodies many of the features of the Long hand horn, is being brought out by the G. Piel Co., Brooklyn; as is the case with the other Long horn it will be marketed by the H. W. Johns-Manville Co. It sells at \$10 with button and cord. The Long hand-operated horn is in three types—Ford Special, or Model F, which has been reduced from \$6 to \$5; Model J, a new type, \$7.50; Model S, \$12.50, operated by Bowden wire. The Johns-Manville Co. in addition is offering a new vibrator horn, the J-M Model C, at \$4. It is suitable for 6 or 12 volts and is standard on the new Dodge Bros. car.

BOSTON NOW HAS GARAGE REGULATIONS TO DIGEST

**Commissioner Plans to Enforce Rules
January 15 and Holds Hearing—
Source of Regulations Is
Discovered**

And now Boston has a set of garage regulations on its hands!

New York state has just got under way a movement for a redraft of the rules which the State Fire Marshal promulgated, and Monday, January 4, the trade in Boston attended a hearing before the Fire Hazard Commissioner to give opinions on a set of regulations drawn for use in the Hub. January 15 is the date of going into effect.

The Boston rules bear a striking similarity to the set which were promulgated by the New York state official, and the similarity has led to a slight investigation which reveals the apparent source of some of the principal clauses. They are contained in a "model set of garage rules" upon which the National Fire Protection Association placed the stamp of approval at its seventeenth annual convention, New York, May, 1913.

The "model" regulations cover the clauses pertaining to: the definition of a garage; the definition of volatile inflammable liquid; fireproofing, forge, boiler and furnace rooms; housing of electrical apparatus; storing of gasoline; filling car tanks with lights lighted; no smoking; waste cans, sand buckets; chemical extinguishers, and calcium carbide. The association at its convention stated that the regulations would be recommended for use in small and medium-sized cities, but the recommendation evidently has been accepted in much higher circles.

The Boston regulations comprise 14 typewritten pages and are not quite so drastic as the New York code; there is no gasoline pump room with its six-inch door sill, but the concrete floors and fireproofing clauses are much the same. The decision in many cases is left to the commissioner, this being the case in the location of garages near school houses and hospitals. This clause is not to affect existing buildings.

The trade associations in Boston have succeeded in working in harmony with the commissioner thus far and it is believed that he will be fair in the matter and not enforce any regulation which is destined to work a hardship on the dealers and garagemen.

OUTDOOR PARADE HELD BY NEW ORLEANS DEALERS

**While Northern Trade Is Shivering
Southern Men Hold Fete—Give
Prizes for Many Pageant
Features**

While the North was shivering late last month and Northern dealers were casting about for enclosed car prospects, the New Orleans Automobile Dealers Association staged an outdoor show and flower parade in the City Park.

Through the activities of Ginder Abbott, of the Abbott Automobile Co., chairman of the Committee of Arrangements, several large moving picture companies made films of the event and the association anticipates considerable publicity for itself and its city. The park, which ordinarily is free to the public, was enclosed and admission was charged, the proceeds being devoted to the Times-Picayune Christmas doll and toy fund.

The most beautiful car—New Orleans Police Department; "The Children's Voyage to Santa Claus." The most artistic car—New Orleans Fire Department; "Santa Claus and His Charges." The best floral decoration—Mrs. M. J. Rosenthal. The most novel decoration—Mrs. H. Weil.

General prizes—Best executed idea, \$100 in gold. Most beautiful car, tire by the United States Tire Co. Most artistic car, silver cup. Best floral decoration, silver cup. Most unique decoration, silver cup. Most grotesque decoration, Stewart horn. Best decorated Ford, \$25 in gold.

Fraternal section—First, silver cup; second, Brown tube.

Owners' section—First, barrel of Polarine oil and steel container; second, tire by the Fisk Rubber Co.; third, barrel of Havoline oil; fourth, steering wheel hand warmer.

Dealers' section—First, mahogany lamp; second, Pyrene fire extinguisher; third, bumper.

Advertising section—Prize, electric chafing dish.

Westinghouse Opens Service Chain

The Vehicle Equipment Department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is opening sales-service locations in New York, Cleveland, Chicago and Indianapolis. It will probably open similar stations on the Pacific Coast. In New York city the station is at 250 West 54th street; in Cleveland, at 2025 Euclid avenue; Detroit, on Woodward avenue; Chicago, at 2007 Michigan avenue, and in Indianapolis at 427 North Meriden street.

End of Shock Absorber Suit

CHICAGO, Jan. 5.—The court of appeals sitting in Chicago reversed the decision of the lower court in the suit handed down last May of the Blackledge Mfg. Co., Chicago, against the J-M Shock Absorber Co., Philadelphia, stating the J-M shock absorber does not infringe the Velvet shock absorber made by the former concern. Judge Sandburn in the United States district court handed down a de-

cision on May 8, 1914 stating that the J-M shock absorber does infringe the Velvet which is manufactured under patent No. 988,229 issued to Charles A. Tilt, March 28, 1911. This patent relates to shock absorber of the coil spring type which prevents excessive shock being transmitted to the car and passengers and also eliminates side sway. The Blackledge Co. claimed in its suit in the lower court that the J-M Shock absorber is made under patent No. 1,015,682 issued to L. P. Jaquet on January 23, 1912.

SUPREME COURT UPHOLDS NON-RESIDENT REGISTRATION

Washington, D. C., Jan. 5.—Special Telegram.—That the state of Maryland has every right to impose a tax on non-resident owners of cars has been established by the United States Supreme Court; the constitutionality of Maryland's law therefore is upheld, the Supreme court having affirmed a decision of a lower court. The case was that of Hendrick vs. the state of Maryland, and the question was first brought up July 10 when Hendrick, who is a Washington man, refused to obtain a license from the state of Maryland to operate his car in that state. The main argument of his attorneys was that the Maryland law was a discrimination against District of Columbia motorists in that the residents of other states are not required to obtain Maryland licenses. In affirming the decision of the lower court the Supreme court said:

"If the statute is otherwise valid, the alleged discrimination against residents of the District of Columbia is not adequate ground for us not to declare it altogether bad. At most they are entitled to equality of treatment and in the absence of some definite and authoritative ruling by the courts of the state we will not assume that upon a proper showing this will be denied."

Rim Makers at Law

Suit has been brought in the United States district court, Cleveland, by the Universal Rim Co., Chicago, against the Standard Welding Co., Cleveland, the former claiming infringement of three of its patents and naming ten others in the bill of complaint. The patents involved are said to be infringed by the Standard Welding Co.'s rims No. 20 and No. 21, in use on many of the leading cars. The patents which are named in the Universal company's bill are Nos. 711,729, 866,986, 915,454, 1,095,770, 1,095,771, 1,095,772, 1,095,775, 1,095,776, 1,095,777, 1,095,778, 1,095,779, 1,095,953, 1,095,996.

BLEEG SAYS THE BANKERS HELPED MAKE TIMES HARD

**Protests Against Attitude of Bankers to
Farmers in Dakota—Says Pros-
perity Is at Hand But
Fettered**

That a different attitude on the part of the bankers in his section of the country would aid dealers greatly, is the statement of John P. Bleg, who distributes the Allen in a large territory surrounding Sioux Falls, S. Dak. He declares the bankers are decidedly unfair in many cases.

"Many of our customers are farmers," stated Bleg at the Allen exhibit at the show, "and there should be good prospects for sales of cars to them. Crops have been good and prices are high; prices are higher than they would be under normal conditions.

"Before the farmer gets the money for his crops he often is unable to buy a car because the banks will not accommodate him; if he wants to buy machinery or anything of that sort his paper is good, but if his paper is going into the hands of a motor car dealer the bank won't lend the money.

"The bankers claim they have to be conservative and that money is tight; I claim the banks are what has made money tight. If we could kill off about 150,000 bankers I think business would be good."

Northway to Have Eight-Cylinder

Keeping step with the public demand the Northway Motor & Mfg. Co., Detroit, Mich., is preparing to place on the market an eight-cylinder motor of the already well-known V-form.

The decision arrived at by the company follows experimenting extending over a considerable period. The first motor, which will have cylinders measuring 3½ by 4½, giving an S.A.E. horsepower rating of 39.2, will be exhibited at the National Automobile Show in Chicago during the week January 22 to 30.

Motometer Wins On Appeal

The United States Circuit Court of Appeals has affirmed the preliminary injunction granted May 21 to Harrison H. Boyce and the Motometer Co., Inc., in its suit against the Stewart-Warner Speedometer Corp., charging infringement of patent No. 1,090,776, covering the Motometer, a device for showing cooling water temperature.

TRADE IN DALLAS MERGES INTO ONE ORGANIZATION

Holds That Union of Dealers and Suppliers Best Solves Association

Problem—J. W. Atwood
President

The Dallas Automobile Dealers Association has been dissolved and both car and accessory men have united in a new organization in which the whole trade of that city is represented. It was felt that the interests of all branches were so closely allied that one organization would best answer the purpose.

J. W. Atwood was elected president; Frank Smith, first vice-president; Wayne Murray, second vice-president; Mack Sterett, third vice-president; W. B. Burwell, secretary; E. O. Thackston, treasurer. Directors, one year, R. L. Cameron, H. T. Hayes, M. A. Sacksteder; two years, Don Safford, B. M. Lindsley and W. M. McClure. All committees will be named by the president.

Prominent Dallas tradesmen who addressed the meeting emphasized the need of harmony between accessory and car dealers. M. A. Sacksteder, W. F. Gordon, formerly secretary of the Atlanta Automobile Dealers Association; H. T. Hays, Frank Smith, Mack F. Sterett and E. J. Hardy were among the speakers.

Those present were: Mack F. Sterett, H. T. Hayes, M. A. Sacksteder, C. H. Potter, A. B. Taber, A. G. Cameron, C. G. Greenaway, Hoyt Wood, B. F. Elias, J. W. Couchman, T. J. Blakeney, F. D. Shorns, T. L. Bond, R. L. Cameron, W. J. Stroud, Leslie B. Dooley.

H. C. Potter, J. J. Fanning, John W. Felix, C. M. Houston, E. W. Ware, C. M. Brown, E. O. Thackston, C. McClellan, W. H. Noble, J. G. Crawford, B. N. Honea of Fort Worth, A. L. Shuman of Fort Worth, M. C. Wolfe, Don F. Safford, L. V. Nogueira.

Tom Harry, Dave Morrison, J. P. Illingworth, Bill Laster, Wayne Murray, W. K. Thompson, Hal Heilman, Ray Leeman, Jack Cassidy, L. H. Berry, H. J. Cohn, J. W. Atwood, Ed. J. Hardy, J. O. Wharton, C. E. Mace, H. L. Battle, J. A. King.

E. E. Pardue, J. M. Thomas, E. P. Angus, S. C. Bovell, F. W. Moore, G. L. Cacle, R. C. Langley, Matt C. Cameron, P. E. Fox, Douglas Hawley, Walter C. Cameron, D. F. Anderson, F. H. Stephenson, N. B. Burwell, W. G. Langley, R. M. Hardeman, F. A. Moss, W. F. Gordon, F. M. Smith, R. M. Lindsley, W. A. Fosdick.

Get Ready for Convention

The Lexington Hotel, Michigan boulevard and 22nd street, in the heart of Chicago's automobile row, has been selected by the Garage Owners Association

of Illinois as the meeting place for the delegates who have been called to form a national association January 27 and 28. The meeting will follow the annual meeting of the Illinois association, which is to be held January 26 in the same hotel.

The Illinois garagemen have received advices from sixteen different organizations that they will be represented by delegates in the convention. The first day will be devoted to a reception and preliminary organization, with the real work the second day. The name Associated Garages of America seems to be meeting with favor, following considerable discussion at the recent Illinois convention in Peoria. Mayor Carter H. Harrison and others will address the convention.

Lozier to Build Only on Order

The creditors of the Lozier Motor Co. had a meeting last week and voted favorably upon the proposition of Attorney Leo M. Butzel that when bona fide offers for cars are received they should be built to fill the offers. Vice-president Joseph A. Bauer of the Detroit Trust Co., trustee, suggested that inasmuch as there is \$200,000 worth of material on hand it would be possible to build 300 sixes and 300 fours if \$300,000 worth of additional material were secured. The fours would be sold at \$1,000 and the sixes at \$2,000, bringing in \$900,000. His suggestion was not accepted.

The trustee will sell the entire plant at auction Thursday morning, February 4.

Motor Car Securities Quotations

	Dec. 31, 1913	Dec. 31, 1914
	Bid	Asked
Ajax-Grieb Rubber Co., com.	105	105
Aluminum Castings, pfd.	97	100
Chalmers Motor Co., com.	91	98
Chalmers Motor Co., pfd.	83	92½
Firestone Tire & Rubber Co., com.	242	250
Firestone Tire & Rubber Co., pfd.	103	110
Garford Co., pfd.	90	90
General Motors Co., com.	37	38½
General Motors Co., pfd.	76	85
B. F. Goodrich Co., com.	23	25
B. F. Goodrich Co., pfd.	79	82
Goodyear Tire & Rubber Co., com.	190	185
Goodyear Tire & Rubber Co., pfd.	92	101
Gray & Davis, Inc., pfd.	94	101
International Motor Co., com.	5	5
International Motor Co., pfd.	15	15
Kelly-Springfield Tire Co., com.	69	70
Kelly-Springfield Tire Co., 1st pfd.	75	79
Kelly-Springfield Tire Co., 2nd pfd.	94	98
Lozier Motor Co., com.	15½	15½
Lozier Motor Co., pfd.	90	90
Maxwell Motor Co., com.	2½	3¼
Maxwell Motor Co., 1st pfd.	21½	22
Maxwell Motor Co., 2nd pfd.	7	7¼
Miller Rubber Co.	115	120
Packard Motor Car Co., com.	115	120
Packard Motor Car Co., pfd.	91	95
Peerless Motor Car Co., com.	15	15
Peerless Motor Car Co., pfd.	75	80
Pope Mfg. Co., com.	1	1
Pope Mfg. Co., pfd.	7	12
Portage Rubber Co., com.	40	25
Portage Rubber Co., pfd.	90	80
Reo Motor Truck Co.	6¼	7¼
Reo Motor Car Co.	14¼	15¼
Stewart-Warner Corp., com.	49	51
Stewart-Warner Spdr. Corp., pfd.	94	96
Studebaker Corp., com.	18	20
Studebaker Corp., pfd.	60½	70
Swinehart Tire & Rubber Co.	88	71
U. S. Rubber Co., com.	56¼	57
U. S. Rubber Co., pfd.	100½	100
Willis-Overland Co., com.	58	62
Willis-Overland Co., pfd.	80	85

* Ex dividend.

ALL TULSA BUSINESS NOW WILL BE ON CASH BASIS

Association of Dealers and Garagemen
Notifies Customers That All Work

Must Be C. O. D. After

January 1

The dealers and garagemen of Tulsa, Okla., placed their business on a cash basis January 1, the move being made through the Tulsa Automobile Dealers Association. After the action had been determined upon, the following article with the signatures of the association's members was run in the daily newspapers:

"After a long and careful consideration we have decided to place our business upon a strictly cash basis. Therefore, on and after January 1, 1915, we make no charge accounts of any description.

"Any concern doing a credit business, no matter how schrewd they may be, accumulate some bad accounts which are a loss. They have the expense of bookkeeper, both of which add to the cost of the goods you buy. By selling strictly for cash we will be able to serve you in a more satisfactory manner, as well as save you money by selling for spot cash, less 5 per cent on all goods and labor.

"We feel grateful to the people of Tulsa for their patronage during the past, and trust that we will have the pleasure of your continued business.

"Thanking you for your liberal patronage given us in the past, and soliciting your future business, assuring you that you will at all times receive our very best attention and that quality will always stand first at our establishments, we remain,

"Yours very truly,

"Tulsa Automobile Dealers Ass'n.

"Cadillac Co. of Oklahoma, Midland Auto Co., Tulsa Motor Car Co., Chapple Bros., New State Auto & Supply Co., Jeffery Motor Sales Co., E. Westermann, Overland Auto Co., Sturm Motor Co., J. T. Forster Auto Co., Reo Motor Sales Co., A. B. Davis Motor Co., Modern Garage."

Work to Talk to John Bull

Among the passengers on the Lusitania today was Bertram G. Work, president of the B. F. Goodrich Co., Akron, who will continue direct with the British Government the negotiations which the Embargo Committee has been carrying on at Washington for the past two months.



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New Eights

PROMISES are numerous that the best inventive genius of American makers has already been turned loose on the eight-cylinder motor, some makers already having completed designs, which in daring go beyond anything that has been developed either in the four- or six-cylinder field. In addition to five makers exhibiting eights in the show, four being shown in chassis, there are a few private exhibits of eights at the various city hotels. These new eights in some cases are exceedingly light and compact, occupying little more width than the four-cylinder motor and less length.

Up to this time the valve-in-the head motor has not been considered feasible in V eight-cylinder construction, but there is one of this type on private view in which the over-all width is kept down by careful designing, so that already it has been demonstrated that it is possible to build the V eight in practically any design. The public is evincing much interest in the eight, the fact that wheelbase can be shortened being one of the points that carry a special appeal. The shorter wheelbase is in demand, especially in the larger cities.

The present show must go down in history as a six-cylinder show, because in the sixes are many more evidences of solving difficult engineering jobs than in not a few of the fours. It is but natural, as a preponderance of the engineering brains of the industry have been focused on the evolution of the six for several seasons, at the same time there being a lesser expenditure on the development of the fours. The last 12

months have revealed indications of renewed activity on the well-designed four, and the present show has some four-cylinder chassis that indicate a new spirit in the four field.

Lower Bodies

DEALERS in general will welcome the lower bodies used on not a few of the 1915 cars, a change brought about in various ways, such as heavier drops in the frame, dropping the forward axle and underslinging the springs, as well as making greater use of the flat spring. The lower body is each year becoming a greater necessity, due to improvement of roads and the higher speeds at which curves and corners will be taken, a condition which the foreign body builder had to face several years ago. But the low body, resulting in a lower center of gravity, is desired in that it aids in reducing the body side sway, and this in turn cuts down the stress and wear on the tires.

Another apparent trend in body design is the movement towards narrower bodies, making the rear seat suited for two rather than three. Once more we can here trace a development seen in the Old World, where the large body gradually decreased in favor with many classes. The four-passenger body offers a neater appearing vehicle, the parallel sides making it easier to achieve the streamline concept than with the wider tonneau. With the narrow body, and the rear seat for two, a greater necessity comes for an auxiliary seat, and if this can be made to fold into a recess in the back of the front seats, so much the better. At any rate it should be so mounted that it can be removed.

Next Week

NEXT WEEK Motor World will issue its Before-Chicago-Show number, which will be a comprehensive review of many accessories and dealers' necessities not covered in the Before-Show issue of December 21. Like the previous issue, that of next week will constitute a most valuable work of reference for the dealer and garageman for the entire year. Many lines of necessities not formerly featured in Motor World will be carried, these including lines of supplies and materials that the dealer needs in his repair-shop, and which the garageman needs and also the repairman. These will be briefly described and prices given with dealers' discounts for quantity business.

In the first Before-Show issue not a few accessories were omitted. These will be included next week. Electric starters, battery-coil ignition, electric vehicles, as well as a score or more of other accessory divisions will be carried.

Motor World's entire object for 1915 is to increase its value to dealers, garages, supply houses, repair-shops, etc., and with this object in mind next week's issue will contain complete specifications of the many motor trucks for this year. These specifications have been compiled at great expense, and they are invaluable to the dealer.

WIDE-AWAKE MERCHANDISING

GIVE TACT TO EACH EMPLOYEE

He Is a Contact Point Between You and the Public— Train Him

Here is a thought to get busy on right away. Every employe in your garage is a salesman. He has it in his power to build, or destroy, or at least WEAKEN your influence with your customers. He is the point of frequent contact and upon your training and development of him depends a sense of responsibility for your business in great measure, whether what he does will be an asset for you or the reverse. This is not theory—it is plain fact.

Thoroughness, truthfulness, tact, diplomacy and honesty can all be reflected by employes. But you must teach most of them. A man may be a good mechanic but be positively unfit to meet people. And yet he must meet them—he has to meet your customers, perhaps, every day. What are you doing to train him so that the contact of the public with such an employe will be beneficial to your institution?

The Leaking Carbureter

A car owner was watching the progress of work on his car. He had been informed by telephone that it would be ready by 12:30 and it was now 2:30. He had made his way to the back of the garage to hurry the work, if possible.

While watching the work he observed that the carbureter was dripping a drop or two every minute. The mechanic was putting a warm-air pipe on the carbureter. The owner feared that in doing the work a connection might have been loosened. "What's that dripping?" he asked the expert repairman.

"Oh, that's just the drain-cock at the bottom of the carbureter."

"How do you know that carbureter has a drain-cock?" asked the customer.

"Well, every carbureter I ever saw had one," was the reply.

"Did you look at this one?" queried the customer.

"No, but I'm pretty sure that's what the trouble is," came back the positive expert.

"But this carbureter has no drain-cock," mildly interjected the customer.

"Well, I don't know what it is then—I didn't look at it. I only said I thought it was the drain-cock. Maybe it's something else."

The customer needed no further evidence to shake his confidence in that garage. He received a very strong impression of inefficiency and carelessness that drove him out of that particular institution forever.

What are you doing to make your men feel and know their responsibility? Are your points of contact trained to reflect honesty, efficiency and all the other qualities that you would like to have the public associate in its mind with your establishment.

MADE AN IDEA GET BUSINESS

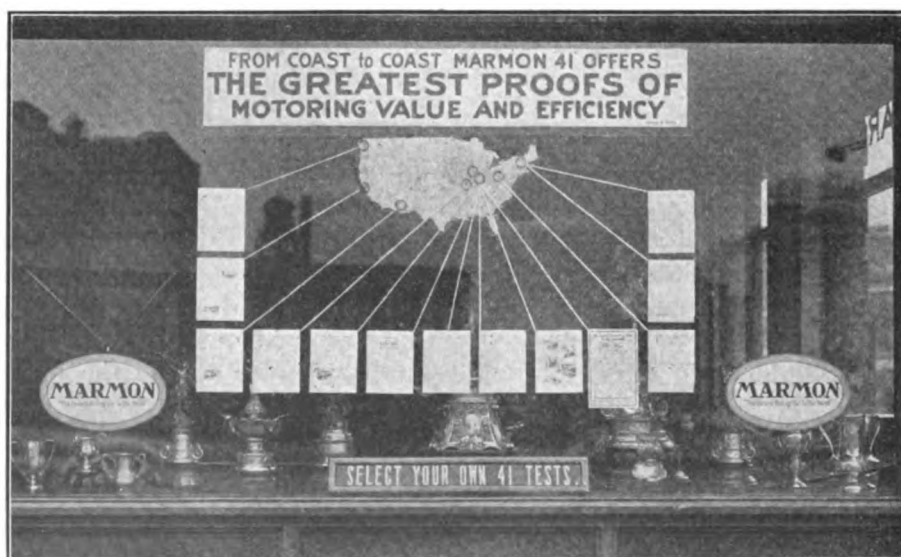
Bowman Departmentized Every- thing Electrical and Sales Began to Grow

Instead of bunching electrical equipment with ordinary accessories, E. A. Bowman & Co., Detroit, has found it profitable to devote a small section of the store to an electrical department.

It is just off the main store and in it is kept everything electrical, including horns, lighting devices, bulbs, lamps and reflectors. The stock is complete and every facility is provided for testing horns, lights or batteries. Prices of all standard supplies are indicated in plain figures on neatly lettered cards.

This little idea has cost Bowman nothing to adopt and has created business.

HOOKED UP PUBLIC AND MARMON PERFORMANCE PROOFS



This illustration shows a simple but effective window display which was used by the Marmon branch in Indianapolis to display graphically the proofs by performance enumerated in three pieces of literature which have been issued by this company. A map of the United States was mounted on the inside of the front glass and from circles drawn around various locations white

ribbons ran to the corners of the pages, which gave in detail the test at each point. Beyond the painted sign used at the top of this display there was no expense to the dealer. It attracted a great deal of attention, and the calls for the literature which was used in this display increased over 300 per cent the first week it was used.

PUT YULETIDE INTO ITS ADS

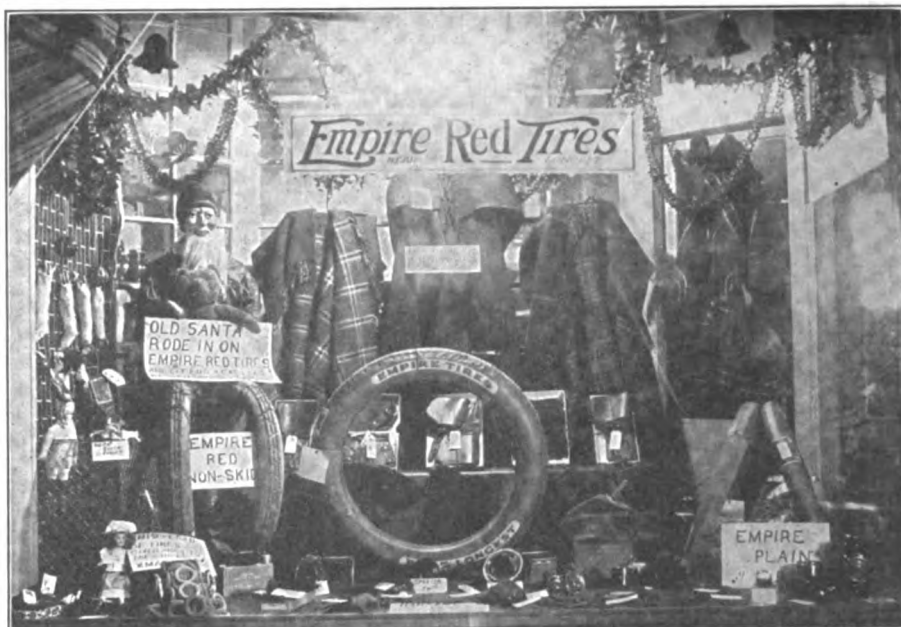
Southern Dealer Cashes in on Holiday Sentiment—Department Year Old

The accessory department of the Greensboro Motor Car Co., Greensboro, N. C., wound up its first year in an appropriate manner with a Christmas window and a smack of Yuletide sentiment in its newspaper advertising. The window and one of the ads, which occupied half of page 6 in the Greensboro Daily News December 6, are reproduced.

The ad is permeated with the gift idea and Secretary, Treasurer and General Manager H. M. Chamblee does not hesitate to assert that accessories and supplies make good Christmas gifts and that there is room for such advertising in the supply business.

Old Santa Claus himself appears in the Christmas window. He has just arrived with a load of Empire Red tires and has a card in his hand stating that he rode in on those same tires. Stockings filled with toys hang at the fireplace; trouble lamps and red crepe paper furnish a glow in the grate. The fireplace is surrounded by a screen to keep the children from falling in.

In the lower left corner of the window is a doll and a pile of miniature red rubber tires with a card stating that these



This window appeared at the same time as the newspaper Christmas advertising and emphasized the desirability of motor accessories and supplies as gifts

will be given to children for Christmas gifts. The display, which is of appropriate winter goods, was designed and erected by Sales Manager George R. Moore. The company was formed by Chamblee nine years ago and has grown steadily, but the accessory wholesale and retail department was not added until the beginning of 1914.

Thought Precedes the Act

Thought leads. Acts follow. If you think the show is a good place to get business and then plan to make it so, you will realize your thought.

If you think the show is a waste of time and good money, don't go. You can't do business when you carry a thought like that in your mind.

GETS MOST NAMES FROM HIS OWNERS

Branch Manager Considers Delivery of Car Beginning of the Sale

"Our most prolific source of prospects is our customers. We get names from customers almost every day—and one man has given us no less than 50 names during the year," remarked Manager Truax of the Studebaker Detroit branch.

"It is surprising what an interest people take in your business when the salesmen try to see that they are satisfied in every way. Our men are taught that the delivery of the car is only the beginning of the sale and they manage to keep constantly in touch with customers, with the result that these pleased owners usually have in mind some friend who they think ought to buy a Studebaker.

"Quite frequently owners drop into our salesroom with no other purpose than to let one of our salesmen know of a red-hot prospect. Of course, this experience comes in some measure to every dealer, but we are constrained to believe that regular attention paid customers for the purpose of knowing that they are getting full satisfaction from their purchase brings a far greater reward than many salesmen suspect. So our men regularly call on purchasers."

329470A

GREENSBORO DAILY NEWS, MONDAY, DECEMBER 6, 1914

A MERRY CHRISTMAS TO ALL



Santa Claus Arrived on Empire Red Tires

And brought to our store a full line; he has made our window his headquarters and is here to show you the leading tire of the day



Wives and Daughters, Give Him a Robe

Gluggary Steamer Rugs, a high-grade rug for automobile and carriage use, all wool 58x80" fringed, extra heavy, \$10.00 value, **Our Price \$7.00**

If You Cannot Afford to Give Him a Tire Give Him a Good Red Empire Tube

If His Lights are not up to date Give Him a New Pair, we will put them on his Car. Any Finish For **\$9.00 a Pair**

Empire Red

Guaranteed for 4000 miles, but are averaging 7500 miles.

Guaranteed and adjusted here in Greensboro. This saves from 3 to 4 weeks delay waiting for tire to be returned. Also express to and from factory. This is factory branch.

SPECIAL TO DEALERS

We can fill your orders from Greensboro at factory prices, 10% off, or more delivered FREE of charge.



Useful Christmas Presents

A Pair of Hansens Gloves for Ladies and Gents, all sizes. **Prices from \$1.25 to \$5.00.**

Large assortment to select from, not a hand full but a full line.



Flash Lights or Trouble Lights Make Useful Christmas Gifts. We Have All Sizes, at Right Prices.

Give Him a Nickel Channel Bar Bumper 2" Bumper Put on His Car For \$10.00

What ever your car needs, we have it. Give us a call. Phone 32

Greensboro Motor Car Co.

208 to 212 West Market Street

THE FIRM THAT APPRECIATES YOUR BUSINESS

The ad showed how supplies may be acceptable gifts. The ad, a half page, is well set up, divisions stand out clearly and the balance is good. There is a big idea in this ad—read it

New Foreign Models Despite European War

Annual Importers' Salon Reveals Latest From Abroad—Eight Foreign and Two American Exhibitors

WITH the works of eight foreign manufacturers and two Americans on exhibition, in addition to the products of several of the representative body makers of England, France, Belgium and the United States, the annual Importers' Salon was opened in the Hotel Astor, New York, January 2. The foreign manufacturers represented are De Dion-Bouton, Peugeot, Isotta-Fraschini, Lancia, Renault Freres, Rolls-Royce, Sheffield-Simplex and Delaunay-Belleville. The body makers represented are the Holbrook Co., Locke and Brewster. In addition to these there are several body manufacturers who have their products incorporated with the exhibits of the manufacturers. Faure, Dunlop and Hardmann tires are also shown.

Six De Dions

In spite of disturbed conditions abroad there are several new models among the exhibits. De Dion is showing six cars; two are mounted on 50-horsepower, eight-cylinder chassis, one on a 20-horsepower eight-cylinder, and two on 16-horsepower four-cylinder chassis.

The two touring cars are Holbrook products and are streamline touring models with the double cowl which has been the feature of foreign bodies of elegance during the past year. On the 20-horsepower eight there is a limousine by Healey and on one of the 16-horsepower fours there is a landaulet by Healey and on the other an inside drive by Holbrook.

No Chassis Alteration

With the exception of the body work the De Dion chassis has had no alteration during the past year. The bodies, however, show the effect of a year's development in moulded design. The touring bodies, following the practice now used by the leading body makers, are of the dull oil finish, though car bodies, such as limousines, landaulets and inside drive cars have the polished surface.

Fiat has made no important changes in mechanical design but some of the motors and chassis dimensions are slightly larger to accommodate the longer chassis. The wheelbase has been slightly

increased on both the 20-30 and the light 30. Altogether Fiat is showing six cars. On the 20-30 there is a limousine and a coupe by Fleetwood and on the light 30 a touring, limousine, sedan and a runabout by Brewster.

The feature of the Fiat exterior appearance is in the use of a moulded radiator which gives an elliptical appearance to the front of the car. The body work on these cars also exhibits a tendency toward the oil finish for all around work and the polished finish for town use. The fitting of the one-man top on cars of higher price is brought out strongly.

Peugeot Shows Four

Peugeot is showing four cars, a stripped chassis, a baby Peugeot, a racing car and a five-passenger touring body. The latter is an example of quiet luxury in this standard type of body. It is from the plant of G. Mossier, Neuilly on Seine, and while along conservative lines is one of the striking bodies at the show.

The Isotta exhibit includes two touring cars, both of seven-passenger capacity, a seven-passenger collapsible landaulet, a special high-speed roadster and a stripped chassis. One of the touring cars, which is mounted on a 45-55 chassis, is a striking adaptation of the streamline design. It is painted black with satin finish. The seven-passenger body on the 12-horsepower chassis has an example of divided front seats with an aisle between the two. A special feature on both these cars is the enclosure of every moving part, giving positive protection against dust and dirt.

Isotta's Front Wheel Brakes

The Isotta exhibit is of interest in that it contains examples of the use of front wheel brakes. On one of the models there is also a brake fitted on the transmission shaft giving three sets. The special 55 roadster shows a departure from the regular 55 car which is furnished with a touring body in that it is an example of light weight construction throughout. It has the same dimensions as far as the power plant is concerned as the regular 55, but in addition it is fitted with hollow connecting rods, a

hollow driveshaft and lighter frames, giving a greatly reduced weight and rendering possible high speeds. It is classified as a gentlemen's roadster and is a good example of a luxurious speed type. It has a seating capacity of three passengers. The wheelbase is much shorter than that of the regular 55, being 129 inches, as compared to 135 on the touring cars mounted on this chassis. The motor is 120 by 160 millimeters.

Striking Boat Design

A striking feature of the De Dion exhibit is a boat-line touring car painted white as far as the body is concerned but having a black hood and black running gear. There is no top or windshield and in place of the side lamps there are ventilating cowls which give the appearance of a marine body. The sharp contrast of the white against the black sets the boat-shaped part of the car in sharp relief against the black background.

Four of the nine Lancia cars have Holbrook bodies, showing original developments of the limousine, landaulet, coupe and inside drive type. Two are by Hayes & Miller, showing a special four-passenger car and a runabout, and three are by Fleetwood. These are an inside drive sporting type, a limousine and a coupelet. In addition there is a stripped chassis.

Sheffield-Simplex Newcomer

Sheffield-Simplex is a new arrival to the ranks of Salon exhibitors this season. The 30-5 chassis, which is in company with another having a genuine Brussels Vanden Plas body. This exhibit is interesting because it, in company with one other, has a Belgian body from the works of the famous manufacturer. The Sheffield-Simplex is fitted with the U. S. L. starting and lighting system and has Lancaster worm drive. As an example of fine material it occupies a high place, the frame, for instance, being of pressed nickel steel with Sheffield steel used in other construction work. All the fittings are nickel and the springs are floating cantilevers.

Renault has eight cars at the exhibit on five chassis, four being fours and the

other a six. All the bodies on the Renault cars are imported. They represent the works of Kellner and Rothschild of Paris and Vanden Plas of Brussels. A special three-passenger runabout on an 18-30 chassis has been lightened by the use of hollow parts, lighter frame sections, etc., though the power plant dimensions and the principal drive units remain the same as on the heavier car.

Rolls-Royce Chassis Unchanged

Mechanically, the Rolls-Royce cars remain the same as they have been for the past 5 seasons. There is one chassis, a six, dressed in four different body styles. In addition to this there is a stripped chassis which has just arrived from the works of the British manufacturer. Bodies are both imported and domestic, two being from the works of Barker & Co., London. These are a limousine and a cabriolet. The other two are from Fleetwood's plant. These are a brougham and a four-passenger design.

Simplex Alters Details

Simplex, one of the two American manufacturers who are included in the Salon exhibit, is showing four bodies on an improved line of two chassis. In addition to these there is a polished chassis. The mechanical changes which have

taken place in the Simplex line are not in the nature of changes in specifications but in such details of the timing, shorter intake manifold, higher carbureter, flush cowl board and the use of a driveshaft service brake on the shaft drive models. This is mounted just back of the gear-set behind the ball and socket universal joint.

The bodies on the Simplex are produced by Quinby and Holbrook. Three are mounted on the larger chassis, known as the 50, on which either shaft or enclosed chain drive is offered as an option. These are a four-passenger inside drive by Quinby, a limousine by Quinby and a seven-passenger touring model by Holbrook. On the 38 there is a coupe-landaulet by Holbrook.

The Latest in Bodies

On the Holbrook stand there are two cars. One of these is a Fiat with a town body. The other is a De Dion eight-cylinder having a body of streamline adaptation in gray-green with an oil finish. This car is fitted with a one-man top and shows the tendency toward making the high-priced body of dull finish in order to give durability under the stress of touring conditions.

Brewster is showing three bodies. These are an enclosed drive with a

collapsible top on a Rolls-Royce chassis, a brougham on another Rolls-Royce chassis, and a brougham on a Delaunay-Belleville six. The combination inside drive with a collapsible top is a unique construction, giving the advantages of a landaulet and a collapsible. The inside drive feature is in line with a general trend towards this style of all-weather body.

Milwaukee Mayor Enters Trade

The mayor of Milwaukee and practically all of the members of the city administration appear as incorporators of the Wisconsin Tire Co. of Milwaukee, which is organized with \$40,000 capital stock to manufacture and sell motor car tires. Dr. G. A. Bading, mayor; Louis M. Kotecki, comptroller; Joseph P. Carney, city treasurer, and Fred G. Simmons, commissioner of public works, signed the incorporation papers. The concern will establish headquarters on 8th street, near Grand avenue. It is stated that the concern will be a cooperative company and that stock will be sold to all motorists at the rate of one share per car. Shareholders thus will be able to purchase tires at 20 to 25 per cent off the usual list. The tire will be branded "Wisconsin" and the new company will use the entire state for territory.

WHERE FOREIGN CARS APPEAR IN AN APPROPRIATE ATMOSPHERE OF LUXURY



Advanced Maintenance

TRUING UP THE WHEELS

By George Fernwell

(Continued from last week.)

The simpler arrangement for lining up wheels previously described, being the one in more general use, its application may be discussed first. It consists simply of two cross rods or bars marked with notches or grooves so that the marks coincide on both rods. The rods when placed one in front and one at the rear transverse of the chassis, form the means of attachment of parallel lines consisting of thin twine or wire.

The rods should be supported so that the lines are exactly the height from the floor of the center of the front axle ends and of the rear axle. The parallel lines should not be so close together that they touch the tires. If the latter were the case it would probably be misleading. See Fig. 1, in which it is assumed that while in reality the wheel A is oblique horizontally with the frame the latter fact would not be obvious with the line touching the tire as shown. On referring to Fig. 2, however, the above mentioned obliqueness of the wheel A, relative to the true position of the line may be readily discovered upon measuring and comparing the distances B and C.

Rear Wheels True

Before proceeding it should be understood that possible results by the use of this simpler method of alignment may be expected only if it may be safely assumed that the rear wheels are in their original condition of alignment with the side members or of the middle line lengthwise of the chassis. This may be considered a reasonable assumption in such instances as that of a shaft drive chassis comparatively new or one that has not been damaged so as to have had the frame bent and approximately restraightened in the neighborhood of the rear axle.

In the case of the chain drive chassis the chain adjustment or distance rods, should be examined to see that they have been adjusted to the same length on each side of the chassis.

With the transverse rods and lines in position, as described above, measurements may be taken at diametrically op-

posite points of each of the rear wheels, measuring from the tire to the line at each point. These measurements should indicate in which direction the transverse rods which support the lines should be moved for the purpose of bringing

up the alignment of the two forward wheels.

It would be better, however, and would lessen the risk of blunder if the positions of the transverse rods and lines were so adjusted that the distances referred

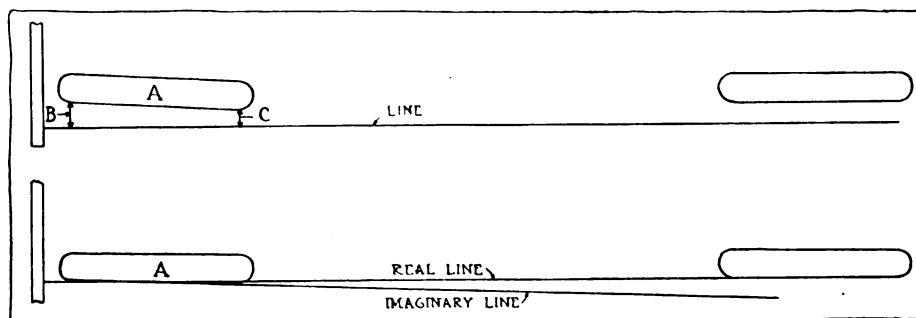


Fig. 1, lower—If the line be too close to the wheel the result will be misleading. Fig. 2, upper—To find the actual position of the wheel measure distances B and C, with the line not too close to the wheel

each line parallel with its adjacent rear wheel.

Obviously, when the last named condition is the case, the distance from a point on the tire, level with the line in front of the rear axle, will be exactly the same as the distance from a similar point on the tire level with the line and in the rear of the rear axle.

These distances referred to may not necessarily be alike between each of the rear wheels and the adjacent line on both sides of the chassis if the fact is noted and properly allowed for when checking

to between each of the tires and adjacent lines on both sides of the chassis were equalized.

The lines now being assumed to be in such a position that they are parallel with the rear tires, the distance at as many points as are accessible should be measured between each side member of the chassis and its adjacent line. In the case of side members which are offset laterally, measurements are advisable at at least two points, both forward and rearward of the offset. See Fig. 3.

Avoid Hasty Conclusions

Normally the measurements referred to should indicate that the side members of the frame are parallel with the lines when the latter are parallel with the rear wheels.

If the measurements indicate any considerable variation of the side members from being parallel with the lines, it should not be too hastily assumed that the frame is bent out of line or that the rear axle is not square across the frame.

It is better to proceed to examine the condition of alignment of the front wheels. The idea being to note the variation, if any, from alignment at as many points as possible before attempting to decide wherein the trouble lies.

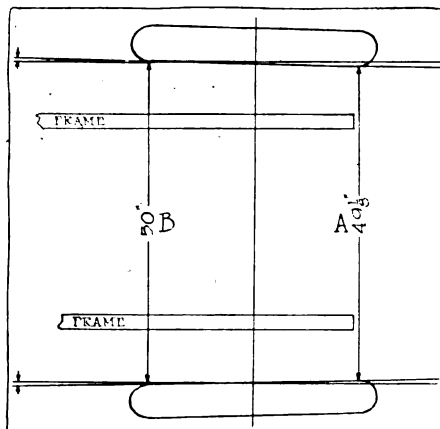


Fig. 6—The general practice is to have the wheels about $\frac{1}{4}$ inch nearer together at A than at B, the distances being 50 and 49 $\frac{1}{4}$ inches

It would also be well in the case of such variation to again examine the lines and note if they are exactly parallel or the same distance apart where attached to the transverse rods supported at either end of the chassis.

On examining the front wheels the steering wheel should be turned so as to bring one front wheel parallel with the line at two opposite points of the tire directly in front and in the rear of the front axle end by measuring from the line to the tire in the same manner as directed for the rear wheels.

Make No Adjustments Now

The front wheel on the opposite side of the chassis should next be attended to, and without moving it measurements may be taken from the tire or felloe both forward and rearward of the axle end to determine how much, if any, it may vary from being parallel with the adjacent line.

It is not advisable to make any adjustments which would change the alignment of the front wheels at this stage. That is, the rear part of the frame and the axle should be practically lined up before adjusting the front wheels.

Assuming the rear wheels to be parallel to the lines and the side members of the chassis to diverge considerably from parallelism, the average distance between the front wheel and the line on one side of the chassis may be compared with the corresponding distance on the opposite side of the chassis. Should the

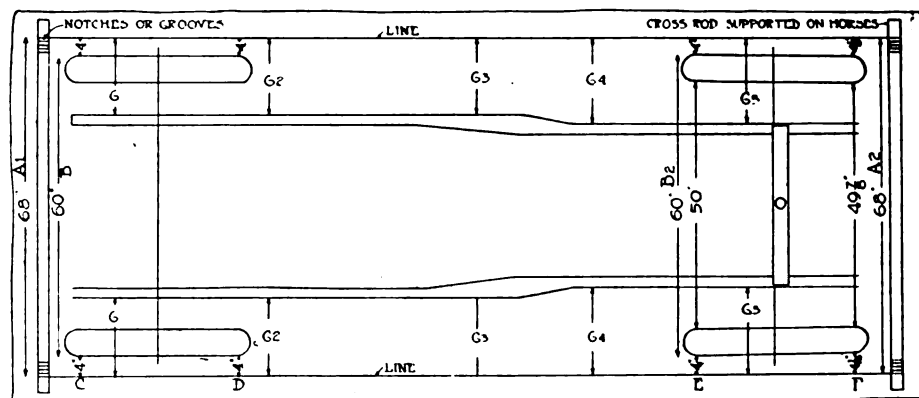


Fig. 3—Measurements on trued-up wheels. A1 and A2 should be equal to start with; when frame is not in a straight line several measurements should be taken along the sides and distances at opposite points should be equal; C, D and E are equal; B and B2 should be equal

distance vary considerably, this together with the divergence of the side members of the chassis from parallelism may be reasonably taken to point to the rear axle being oblique to its true position on the frame or that the frame is bent somewhere near the rear axle.

Figure 4 illustrates how even a slight misalignment of the rear axle and wheels will throw the latter seriously out of line, or out of track, with the front wheels.

Assuming in turn an instance in which the rear wheels are parallel with the lines and the side members of the chassis frame, in this case to be parallel with the lines also, full attention may then be devoted to the alignment of the front wheels.

If under the last described conditions of rear wheel and frame alignments the

distance between the right and front wheels and the adjacent line is found to be somewhat unequal this would not necessarily be serious, as long as it were possible to drive the car straight ahead with the front and rear wheels in parallel tracks, although the rear wheel on either side of the car might not follow exactly in the same track as the respective front wheels. See Fig. 5.

Obviously there are limits to the conditions under which this would not prove destructive to the tires. For instance, a rear wheel running not in direct alignment but in parallel alignment with its respective front wheel and assuming the two wheels to be rolling in a frozen rut just wide enough for the tire, the rear wheel would be trying to grind away the side of the rut.

Made the Wheels Track

It is better, from all points of view, to aim at aligning the wheels so that the rear and front wheels track as nearly as possible.

To locate the cause of the front wheels being an unequal distance from the lines, a systematic examination should be made of the front axle, the steering knuckles, and adjacent parts of the chassis frame to discover deformation or twists which could be responsible for a misalignment. This part of the work must not be confused with the separate problem of adjusting the front wheels in their normal position relative to each other.

It is the general practice to so arrange the drag link and steering arms for driving straight ahead that the front wheels are not quite parallel with each other when measured horizontally transversely across the chassis at points on the tire directly in front and at the rear of the front axle ends. In other words, the front wheels would be adjusted relatively to each other so that they are about $\frac{1}{8}$ inch closer together at the front. Fig. 6.

(To be continued.)

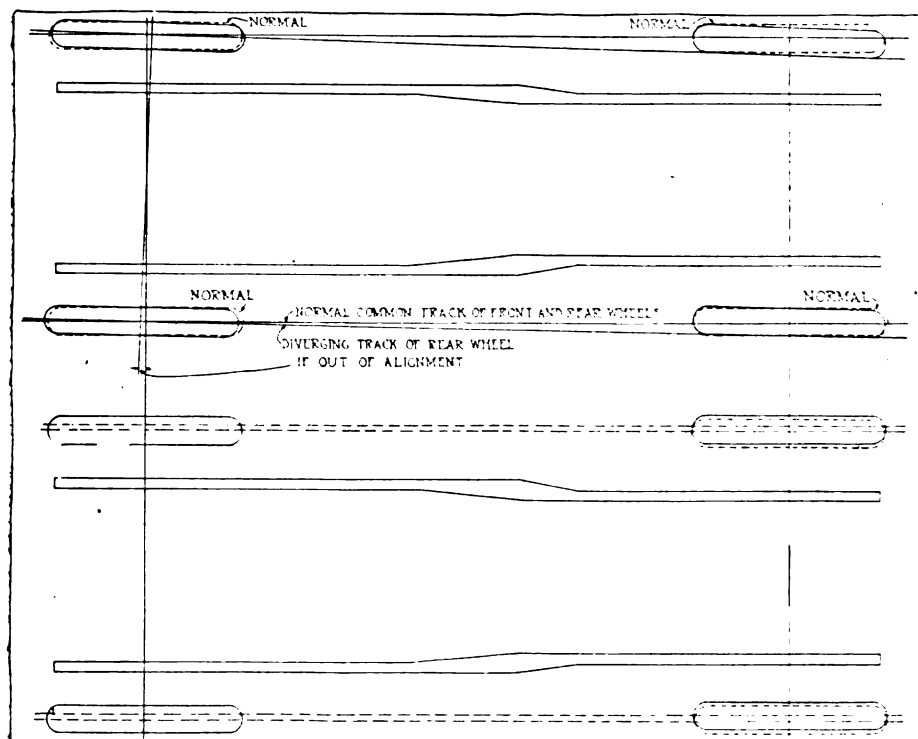


Fig. 4, upper—A slight misalignment of the rear axle and wheels will throw the latter seriously out of track with the front wheels. Fig. 5, lower—Illustrating how the car may travel straight ahead with the front and rear wheels not tracking

Has Special Room for Closing Contracts

Missouri Dealer's New Home Has Up-to-date Features

Turntables and Cosy-corner Waiting Room for Women

Several novel and up-to-date features have been incorporated in the new home of the Selden-Maxwell Auto Co., which handles the Maxwell, Hudson and Detroit Electric in St. Joseph, Mo. These are:

Sale-closing room, where things are quiet, there is nothing to distract the prospect and sales may be closed without exterior annoyances.

Two turntables, one in the salesroom for car display and the other in the garage for facilitating operations.

Rugs, table, chairs and a cosy spot for women who are waiting for their husbands to conclude business.

No pits. Cars are hoisted by differential blocks and workmen work in a standing position.

Electric sign, 16 x 24 feet, saying "Maxwell and Hudson Motor Cars."

The building has been constructed for efficiency and comfort and to appeal to the class of people with whom the company does business. One object has been to give an impression of permanency and stability, for, says, V. E. Malenfeldt, "we expect to stay in business and not simply sell machines, but sell 'transportation service' which, in the last analysis, is what people buy."



A final touch of comfort was added by the rug, table, lamp and chairs, for women whose prospect-husbands are busy examining cars. The turntable, besides being a display feature, aids in showing the car to a prospect. The wide doors at the rear make it possible to change cars frequently without difficulty.

The new building stands in a triangle at Frederick avenue and 11th and Faroan streets, the former being Automobile Row, and has 130 feet of plate glass around the salesroom. Illumination is by five 250-watt units in semi-indirect fixtures, giving practically a shadowless room.

In the point of the salesroom is one of the turntables, built in the company's shop; it is electrically operated until 11 o'clock at night and, carrying a new car, is a good advertisement. The whole structure is of brick and concrete.

The garage turntable is used for turn-

ing cars; this also was built in the shop; it is never necessary for a car to back out of the garage. There are no posts; the garage is one-story and is on a level with the salesroom; the repair-shop is in a semi-basement with a grade entrance on Faroan street.

The company is making a bid for a greater electric car business. It has considerable already and has installed a four-panel General Electric motor generator outfit and has added mercury-arc rectifiers to care for increased business. There are numerous sockets for drop lights for the convenience of customers.

The special room for closing contracts is termed a "separator room."

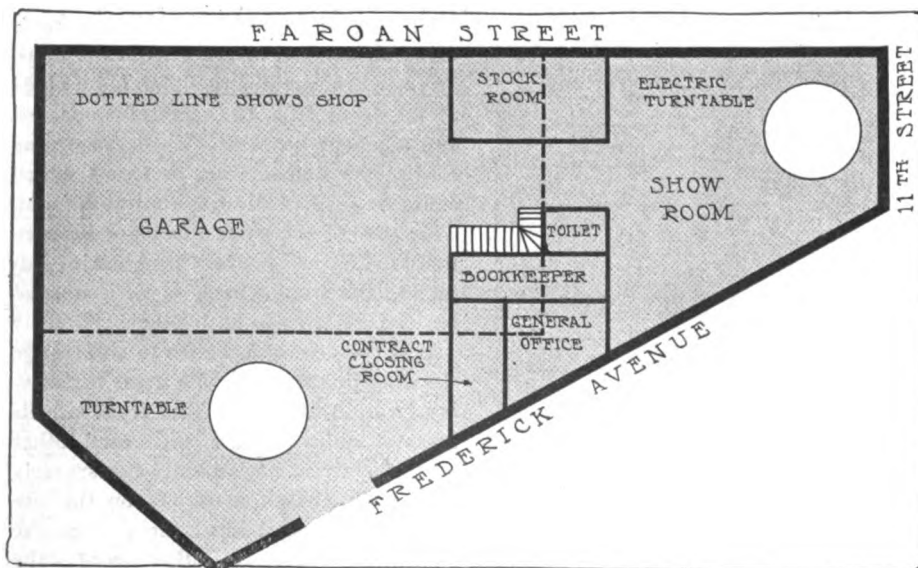
The walls are tinted in gold and brown with mottled finish, and the furniture and rugs are dark, giving a restful ensemble. This was installed because the expansive plate-glass front made it difficult to concentrate the prospect's attention on the sale.

Those Free Show Tickets

"It's funny, but usually our most insistent requests for show tickets come from fellows who turned us down and bought some other make of car," said a dealer who is very popular.

"What do you do about it?" was asked him.

"Oh, we try to use judgment. Some we turn down without question. Others we favor because we think we see indications of a leaning towards us. But not many," was the reply.



The salesroom, 45 x 66, has 130 feet of plate-glass front. The contract-closing room, back of the office, is also used by women who are waiting for their electrics to come from the garage. The garage, on the same floor as the salesroom, is 80 x 110 feet and postless. The shop, in a semi-basement, is 60 x 80 feet.

BEFORE-CHICAGO SHOW ISSUE

MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 2

New York, January 13, 1915

Ten cents a copy
Two dollars a year



They Stop the Skid Before It Starts

They "Stand the Run"

If you measure tire quality in miles you will never use another make of casing after measuring the life of a "FALLS."

FALLS TIRES mean quality, safety, service and comfort.

They are the kind that "never slip."

EASTERN DISTRIBUTORS: The Falls Tire Co., 633 N. Broad St., Philadelphia, Pa.—Royal Tire Co., 833 7th Ave., New York City, N. Y.

WESTERN DISTRIBUTORS: Prigge Bros., 1344 Michigan Ave., Chicago, Ill.—The Denver Rubber Co., 1433-35 Lawrence St., Denver, Colo.—Naegele & Lamb Co., 1204 Hennepin Ave., Minneapolis, Minn.—Costello & Lang Co., San Francisco, Cal.

THE FALLS RUBBER CO.

Factory, Cuyahoga Falls, O.

Cleveland Branch, 2001 Euclid Ave.

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Follow the White Foot Prints They Lead to Satisfaction in Brake Lining

Tireless study, labor and experiment have taught us that Multibestos stands today unequalled—a brake lining meeting every requirement of the hardest service.

With this perfection of quality we have aimed to provide protection to the car owner and special service to the trade. This we have done by marking Multibestos with plain white lines across the fabric exactly one foot apart.

These White Foot Prints are exclusive with Multibestos and will always identify it from other brake linings. And they also afford a great saving of time and inconvenience to the men in the trade who are handling Multibestos, for the marks are spaced exactly and can be used for measurement when cutting from stock to fill orders.

This sales service and protection backed by the supremacy of the goods themselves make Multibestos in every way the logical lining for every live dealer.

Standard Woven Fabric Company

FACTORY, FRAMINGHAM, MASSACHUSETTS

SALES BRANCHES

Boston—F. Shirley Boyd, 903 Boylston Street

Chicago—F. E. Sparks, 1430 Michigan Boulevard

Philadelphia—N. A. Petry Co., Inc., 1427 Vine Street

San Francisco—Fred Ward & Son, Inc., Corner First and Howard Streets

The picture is good but we wish you could see the cabinets themselves—a perfect blend of the useful with the ornamental.

Built in sections, each with a capacity of 700 feet.

A separate compartment for each size.

Each roll revolves on an axis.

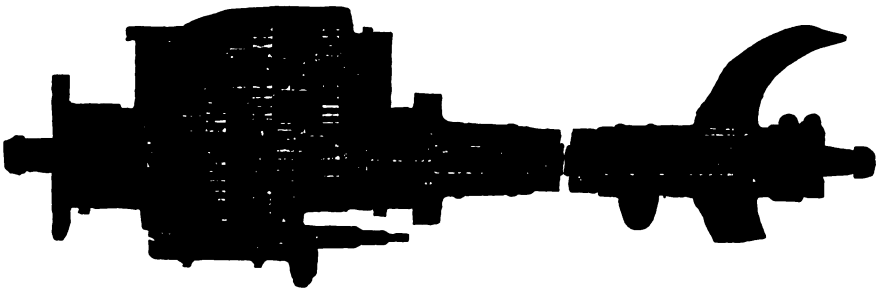
Stained to match the woodwork of any store.

Furnished free with stock orders.



COVERT

TRANSMISSIONS



COVERT TRANSMISSIONS are the choice of those who make quality the chief consideration. This quality is the result of a specialization in this field, a completeness of equipment and organization, and the creation and maintenance of a standard that is satisfied with nothing less than the best.

The inevitable result has been a product that has taken front rank in efficiency, strength, silence and durability and which is found in ever-increasing quantities in both pleasure cars and trucks of the better class.

We shall be glad to place our knowledge and experience at your command and have our engineers co-operate with you in adapting COVERT TRANSMISSIONS to your product.

COVERT MOTOR VEHICLE CO.

Sales Office: Detroit, Mich.
Factory: Lockport, N. Y.

"NORMA"

SILENCE

SPEED

At The Automobile Shows

An investigation by the careful buyer who considers the service quality not only of a car as a whole but also of its accessories, will reveal the fact that "**NORMA**" Ball Bearings are the standard bearings in the high-grade magnetos, lighting generators and starting motors used on cars of the better class. A "**NORMA**"-equipped electrical accessory on a car stamps it as a car for service—a car in which bearing troubles in the electrical accessories will never be experienced.

Let Us Send You
The "**NORMA**" Bulletins

PRECISION

SERVICE

The Norma Company of America

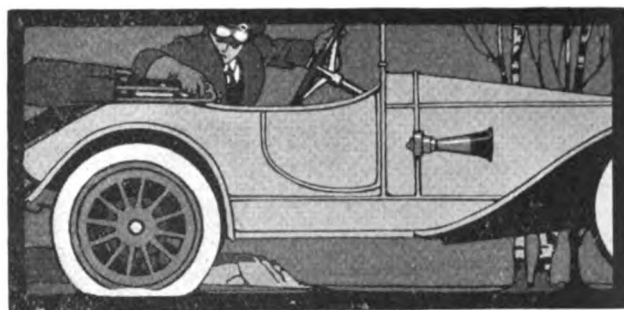
1790 BROADWAY

NEW YORK

"**NORMA**" Ball, Roller, Thrust and Combination Bearings

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Gone Flat Again!

No sharp report. Just the gradually perceptible jolting that tells of a leaky tube gone flat again. Hot, shadeless road and a dusty, dirty job.

That's the story of the needless puncture so common with cheap, machine-made tubes that leak around valves and become porous in service.

The way to avoid these unnecessary punctures is to equip your car with Kelly-Springfield Tubes, which are made *slowly and painstakingly by hand and out of real rubber*.

Kelly-Springfield Tires are made the same way. Use them with Kelly-Springfield Tubes and you will add increased tire mileage to freedom from needless tube trouble.

Send for "Documents in Evidence" which tells the experience of others

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The Hearn Tire & Rubber Co.,
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The Southern Tire & Repair Co., Houston and Beaumont, Texas

The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.

The Olmsted Co., Inc., Syracuse, N. Y.

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L. J. Barth, Rochester, N. Y.

Seifert & Baine, Newark, N. J.

Atkinson Tire & Supply Co.,
Jacksonville, Fla.

Central Rubber & Supply Co.,
Indianapolis, Ind.

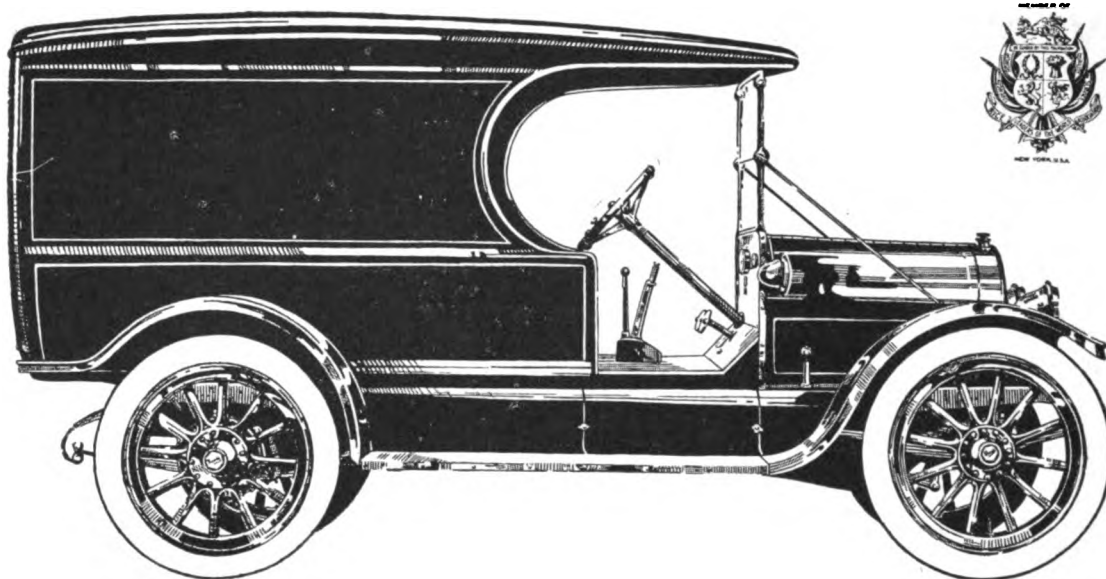
C. D. Franke & Co., Charleston, S. C.

K. & S. Auto Tire Co., Limited, Toronto, Ont.

Todd Rubber Co., New Haven, Conn.

Barnard-Michael Tire Co.,
Buffalo, N. Y.





\$850

With open body

*Equipped with Electric Starting and
Lighting System*

Overland
DELIVERY
CARS

Prices f. o. b. Toledo

\$895

With closed body

*Equipped with Electric Starting and
Lighting System*

Increase Your Business Radius

The Overland Delivery Car adds to your area of operations, increases your trade and multiplies your profits.

This car threads the most congested traffic with surprising ease. Its light weight and short turning radius make possible the most rapid delivery work.

The very latest mechanical improvements make the

Overland Delivery Car very economical to operate. It costs but one cent a mile for fuel and oil.

And its price is less than \$900. This includes two unit electric starter, electric lighting system, high tension magneto, 4 inch tires and many other advantages.

Catalogue on request.
Please address Dept. 194.

The Willys-Overland Company, Toledo, Ohio.



Vol. XLII

New York, U. S. A., Wednesday, January 13, 1915

No. 2

Chicago Show, the Show of Dealers' Business, Bids Fair to Rival Gotham

**Plans for Big Midwestern Exhibition Near Consummation—Opens
January 23—Total of 258 Exhibitors to Display Wares**

THE Chicago 1915 Motor Car Show, the second of the big motor events of the year, will open at 2 o'clock Saturday afternoon, January 23. As usual, it will be held in the Coliseum and the First Regiment Armory.

With this western event always a rival of the earlier New York show and with the latter this year the best ever staged since the first shows were held in Madison Square Garden fifteen years ago, the Chicago show this year should mark another upward step in the industry's exhibition history.

Each Show Better

It means much when it can be said that every show staged has been bigger and better than the one before it; there has been not one step or retrogression.

At the Chicago show there will be 258 exhibitors; of these, 74 will display cars, 176 accessories and parts, and none motorcycles; 8 electric makers have taken space. The provision for trucks will be the same as in New York; a space will be set aside with desk room for the representatives of the different companies, where they may transact business and keep engagements.

The doors will open daily—with the exception of the first day—at 10 in the

morning and will close at 10:30 at night. Admission will be 50 cents, with the exception of Society Day, Wednesday, when it will be \$1.

Admission to accredited dealers is, of course, free; one member of each known dealership firm has long since this been recorded by the National Automobile Chamber of Commerce and, if he has not already received it, he will receive a credential card, such as was illustrated in the Before New York Show issue of Motor World December 23.

The dealer presents this card at the Dealer Bureau at the right of the entrance in the Coliseum, where it is checked up on a card index file, and he is given a button which, with a return card, thereafter constitutes his credentials. Each time he leaves the show he displays his button and is given a return check and each time he enters he displays his button and surrenders the return check.

New York Drew 4,000 Dealers

Whereas the New York show draws dealers from the whole United States—there were 4,000 of them—the Chicago affair is more restricted in its territory, yet draws about 10 per cent more; there are fully as many dealers in this Windy

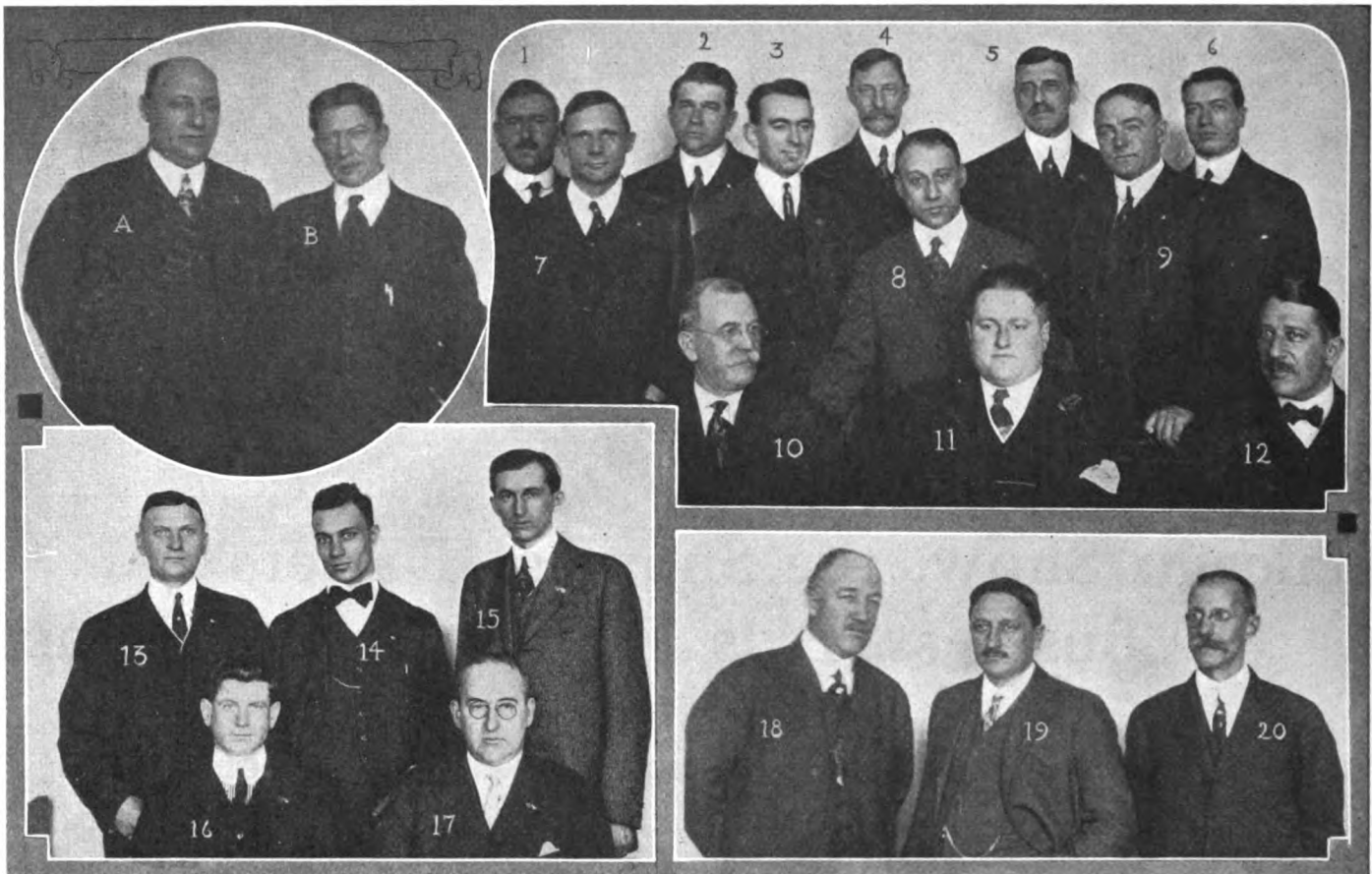
City exhibition, but there are more of the smaller business representatives, dealers who are not so large as some of the big distributors who make transcontinental trips to the metropolitan function. They come from the hundreds of smaller towns of the Middle West.

Come to Do Business

But there is this distinction—they come to do business. Many of them are on the lookout for agencies, are anxious to take on a new car to round out their lines. Among the visitors are many who thus far are enrolled only as garagemen but who wish to make a salesroom an adjunct of their business. There will be many garagemen in Chicago during the show, for the Garage Owners Association of Illinois meets in the Lexington Hotel Tuesday of show week. And Wednesday and Thursday of that week will be held the meeting which the Illinois association has called for the formation of a national body.

Inasmuch as many of the dealers who will visit the Chicago show are also garagemen, the accessory display will be of particular interest. Here will be found many items of garage equipment and devices which are designed to make the operation of a garage more modern, effi-

Snapshots of Dealers Who Visited the New York Show



A—E. A. Sattler, sales manager, Hoover Rubber Co., New Brunswick, N. J. B—Vincent Mulherin, Standard Auto Supply Co., Boston. Franklin group: 1—Clayton S. Carris, Chicago district manager. 2—Arthur L. Clark, Arthur L. Clark Co., Bridgeport. 3—F. V. Price, Jr., Elizabeth Automobile Co., Elizabeth, N. J. 4—George Ostendorf, Buffalo dealer. 5—Glenn A. Tisdale, president and manager, Franklin Motor Car Co., New York city. 6—W. L. Mallon, Mallon & Earle, Newark, N. J. 7—Cowles Tolman, New Haven. 8—A. G. Perretz, Brooklyn dealer. 9—W. L. Wilcox, W. L. Wilcox Co., Providence. 10—George Mason, Newburgh, N. Y. 11—J. Miller Kalbach, J. Miller Kalbach Co., Reading, Pa. 12—George H. Leonard, Auburn, N. Y. Reo group: 13—C. O. Reichert, Reichert Auto Co., New Haven. 14—A. E. Cooper, Paterson Vehicle Co., Paterson, N. J. 15—M. D. Kidder, Linscott Motor Co., Boston. 16—Louis Hoyt, Louis Hoyt Garage, Haverstraw, N. Y. 17—George A. Patten, Linscott Motor Co., Boston. 18—D. R. Harvey, manager, Iver Johnson Sporting Goods Co., Boston. 19—Frank E. Wing, Boston, Marmon dealer. 20—S. J. Francis, treasurer, Iver Johnson company, Boston

cient and up-to-date. Manager Samuel A. Miles has gone to great expense in the decoration of the show buildings for the event. As soon as the New York show closed Manager Miles and his squad of workers took a train for Chicago and will remain there until the show business is completely wound up.

New York Show Best Ever

About 310,000 people passed through the gates of the Palace during the seven days the show was on. Thursday was the biggest day ever seen at a motor car show. The paid admissions were 12 per cent in excess of last year, and last year was greater than 1913, and so on back through the whole fifteen years of shows.

Dealers to the number of 800 a day passed the dealers' gate; about 4,000 registered at the Dealers' Bureau. While quite a number took on agencies these figures are not readily divulged by exhibitors. Dealers were present from the whole United States.

To Nationalize Market Reports

Chicago Association Lays Plan Before Eastern Dealers

THE Chicago Automobile Trade Association, an organization of car and accessory dealers, took its first active step last Thursday in its endeavor to nationalize its Used Car Central Market Report, which is a complete report of prices at which used cars have been sold in the Windy City. The association gave a luncheon at the Engineers' Club in New York city and entertained approximately 40 car dealers from New York, Boston, Buffalo, Syracuse, Rochester, Brooklyn, Newark and other eastern centers.

As a result of the luncheon, the report

will be considered by the different dealers' organizations represented with the thought of cooperating in the quarterly market report, thereby giving national scope to the work.

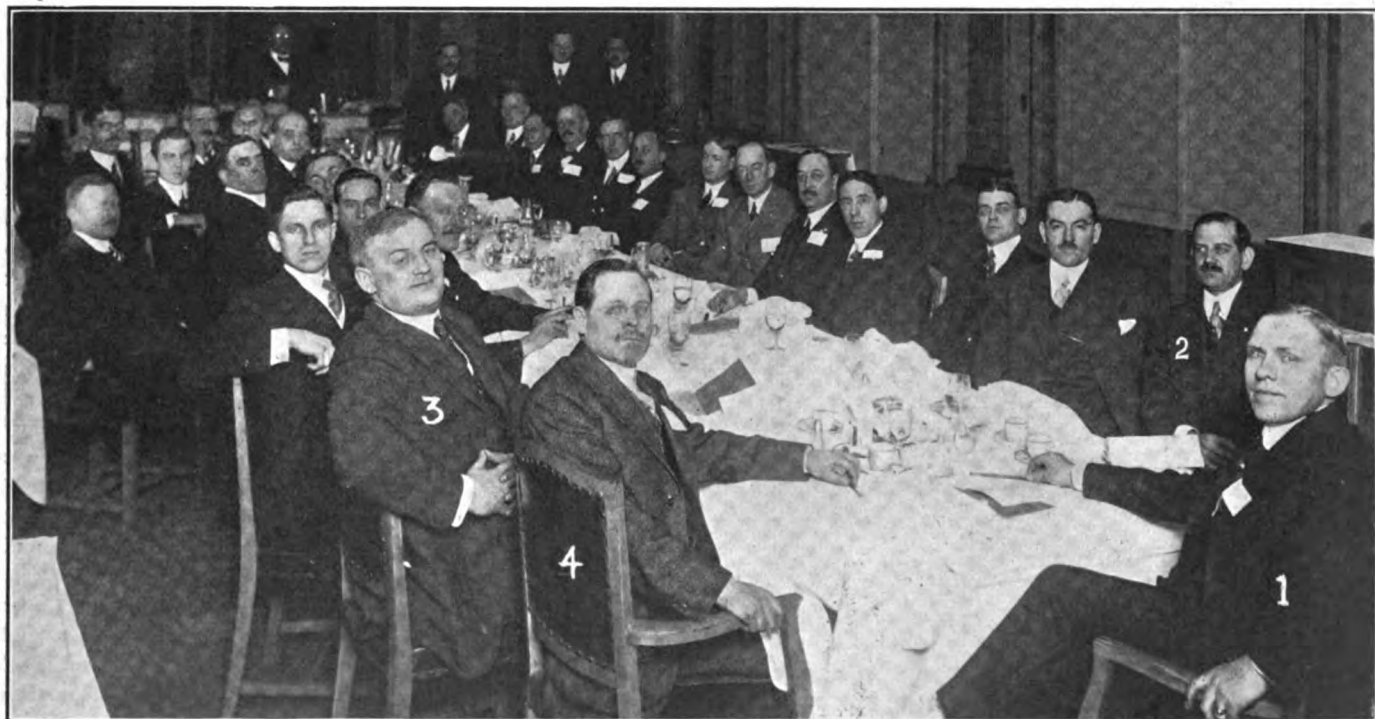
The Chicago association was represented by President H. M. Allison, Treasurer Henry Paulman and C. W. Stiger. President Allison said the plan of nationalizing these quarterly market reports consisted in having the different dealers' associations furnish the prices at which their used cars are sold, and incorporating these prices.

Alfred Reeves, general manager of the National Automobile Chamber of Commerce, Inc., was heartily in favor of having the Chicago movement taken up in the East. There are approximately 21,500 dealers in the United States, and this number, he said, should have some national organization, and this question of market prices is one of the first things that should be considered. Other speakers favored the plan.

They Went to Gotham to See Trade's Greatest Exhibit



Studebaker group: 1—E. H. Craw, wholesale salesman, New York territory. 2—F. S. Nicholson, Port Jervis Garage, Port Jervis, N. Y. 3—John E. B. Payne, Payne Automobile Co., Troy, N. Y. 4—F. L. Mills, Elm Auto Co., Bridgeport. 5—B. L. Hanger, Connecticut representative. 6—F. L. Sanford, Brooklyn branch manager. 7—Lafayette Markle, L. Markle Co., Chicago. 8—T. F. Feltus, Studebaker Garage, New Haven. Jeffery group: 9—F. R. Lauscher, F. R. Lauscher, Inc., Rochester, N. Y. 10—Milo J. Graves, Glens Falls Automobile Co., Glens Falls, N. Y. 11—H. C. Pearsall, same company. 12—C. P. Rockwell, C. P. Rockwell, Inc., Boston. Stutz group: 13—E. J. Montigny, Brooklyn dealer. 14—Harry W. Anderson, factory sales manager. 15—A. A. Landry, Stutz Motor Car Co., Chicago dealer. 16—S. R. Blocksom, S. R. Blocksom Motor Co., Philadelphia, Pa. 17—William Parkinson, president, Stutz Motor Car Co. of New York. 18—W. M. Sharpe, tire jobber, New York city. 19—Kenneth B. Spencer, salesman, Chicago branch of Voorhees Rubber Mfg. Co. 20—E. R. Schultz, Sioux City, Ia., Schultz Auto Supply Co. and also manager of Sioux City speedway. 21—J. F. Callanan, manager for John Caldwell, Boston supplyman; weighs 320 pounds.



DINNER GIVEN BY CHICAGO AUTOMOBILE TRADE ASSOCIATION TO EASTERN DEALERS—1—H. M. Allison, president of the Chicago Automobile Trade Association. 2—Alfred Reeves, general manager of the National Automobile Chamber of Commerce. 3—Henry Paulman, treasurer of the association, Pierce-Arrow dealer. 4—C. W. Stiger, general manager of the Stromberg Motor Devices Co., Chicago



THE OVERLAND DEALERS' DINNER AT THE BILTMORE—The men at the speakers' table are shown separately in a small group. From left to right they are—Superintendent Plughoff, of J. W. Leavitt & Co., San Francisco; Charles Y. Knight, President John N. Willys, Vice-president C. S. Jamison, Director George Stevens, of the Toledo Museum of Art; Sales Manager H. B. Harper, C. T. Silver, metropolitan distributor



The speakers' table

MANY DEALERS DINE AT SHOW

Factories Are Hosts to Those
Who Visit Metropolis

MORE than 400 Overland dealers, mostly from east of the Cleveland-Atlanta line, attended the annual banquet given last week by the Willys-Overland Co. to its visiting representatives at the New York show. The large banquet hall in the Hotel Biltmore was filled, the gathering being by far the largest of any similar function ever held in New York.

President John North Willys in addressing his dealers made the prophecy that within a year there would be at least five twelve-cylinder cars on the American market, a prophesy of particular interest in view of the present activity in the development of the eight-cylinder motor.

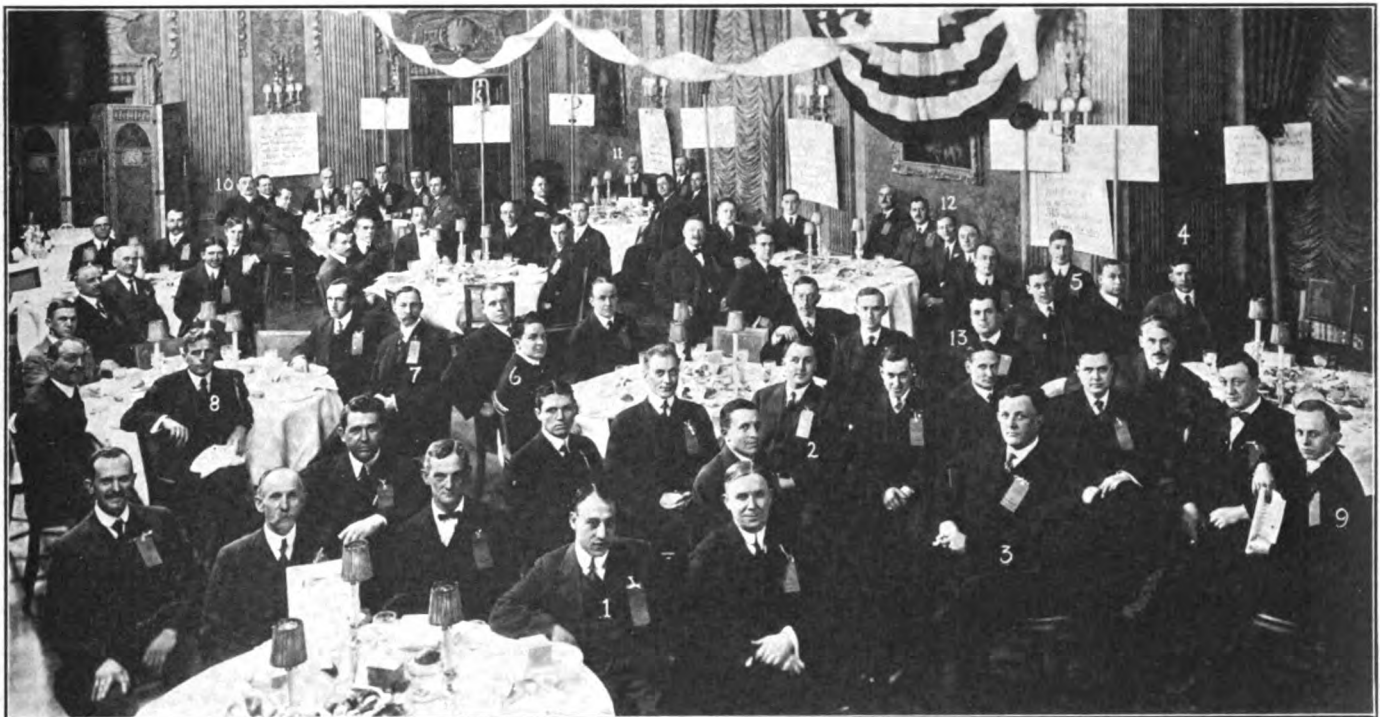
Mr. Willys told of how seven years ago, on January 9, he went from New York state to Indianapolis to take charge of the Overland plant in that city. It was five years since the Toledo plant was taken over. In letting the dealers into many of the factory secrets Mr. Willys told of many factory improvements introduced to facilitate production.

One of these is a new system of varnishing whereby a runabout body can be varnished in 62 seconds and a touring car body in a minute and a half. New methods along the line of the endless moving chain are being introduced in certain assembly parts. The factory is being constantly enlarged and this work of enlargement is scheduled to keep right along in spite of the talked-of depression of today, which does not seem to dishearten the Overland people.

In referring to future Overland plans so far as sixes or eights or twelves might be concerned, Mr. Willys assured the dealers that his engineering department was entirely familiar with all that was going on in the development of these new motor types and that their own



THE DEALERS' DINNER OF THE PAIGE-DETROIT MOTOR CAR CO.—1—President Henry M. Jewett. 2—G. A. Willy, Bieglow-Willy Co., Philadelphia. 3—F. H. Schall, Schall-Crouch & Co., Baltimore. 4—William Baxter, Springfield, Mass. 5—Henry Krohn, director of sales. 6—A. L. Tisch, advertising manager. 7—Sherwood Hall, Jr., Paige Co. of Boston. 8—Mr. Henderson, Portland, Me. 9—L. C. Dalley, New York branch. 10—Mr. Faunce, Interstate Auto Co., Columbus, O. 11—E. S. Clark, Hartford, Conn. 12—David Grody, Silverman & Grody, Syracuse. 13—S. Silverman, same company. 14—Mr. Klinger, Klinger Automobile Co., Pittsburgh



ANNUAL DEALERS' DINNER OF THE FRANKLIN AUTOMOBILE CO.—1—A. G. Perretz, Brooklyn. 2—Andrew Auble, Toledo. 3—J. E. Hade, factory, Syracuse. 4—C. W. Rockwell, Cleveland. 5—Walter Kneip, Baltimore. 6—Otto Lawton, Boston. 7—George Ostendorf, Buffalo. 8—John Wilkinson, Syracuse, designer of the Franklin motor. 9—Hugh H. Goodhart, advertising manager. 10—Glenn A. Tisdale, New York. 11—Clayton S. Carris, Chicago district manager. 12—Arthur Holmes, sales manager. 13—Mr. Garber, Rochester

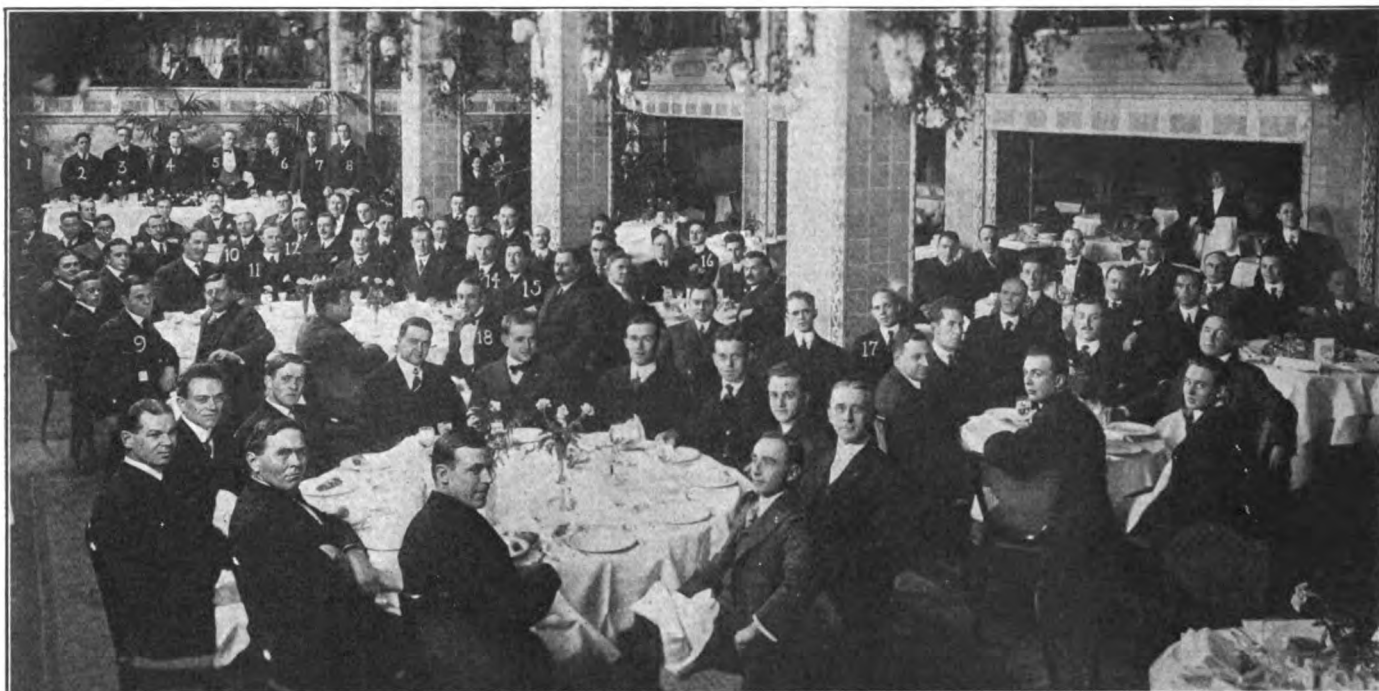
laboratories were busy and in touch with affairs.

Charles Y. Knight, following Mr. Willys, told of the activities of the Willys-Overland Co. in the development of the Knight sleeve-valve motor, and also of the success this motor is meeting with abroad.

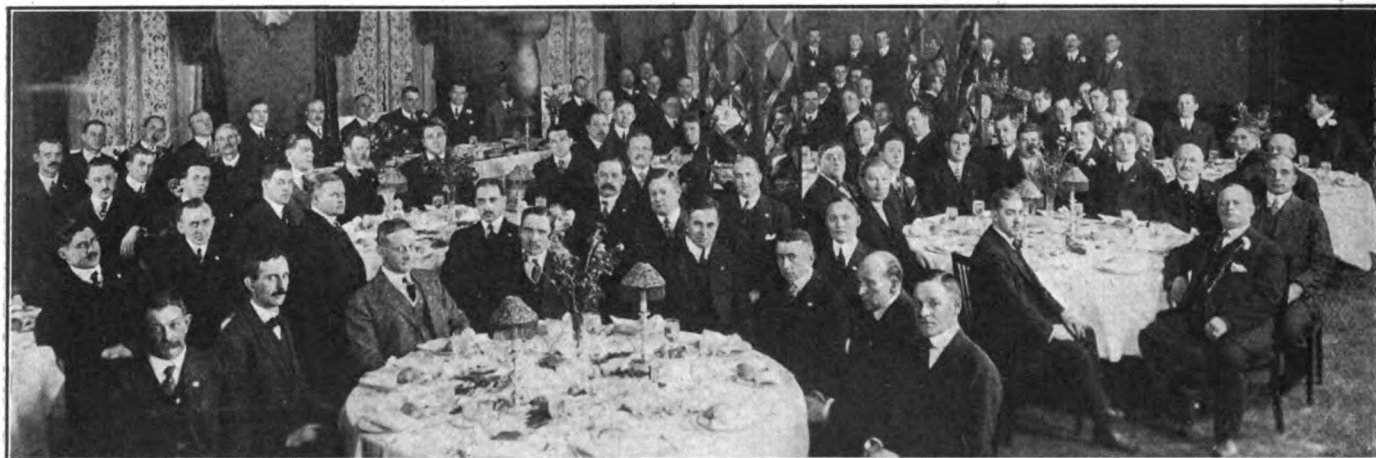
PAIGE MEN CONFIDENT

Confidence of the dealer in the factory and of the factory in the dealer was the theme of the address of President Henry M. Jewett at the dealers' dinner of the Paige-Detroit Motor Car Co. at Reisenweber's Thursday evening. He also

urged greater cooperation between these two branches of the Paige portion of the industry. President Jewett also outlined the company's policy and production for the ensuing year. Other talks were given by Sales Manager Henry Krohn, Mr. Alexander, of the McManus advertising agency, and President H. S. Firestone,



ANNUAL DINNER OF CHARLES E. RIESS, NEW YORK HUPMOBILE DISTRIBUTER—1—George R. Morris, Riess's retail sales manager. 2—Martin F. Murphy, Riess's general manager. 3—William C. Howard, assistant sales manager, factory. 4—Charles E. Riess. 5—Lee Anderson, advertising manager, factory. 6—Harry Fosdick, Wentworth-Fosdick Co., Boston. 7—C. J. Fox, Jr., service manager, factory. 8—P. H. Greer, Los Angeles. 9—J. G. Roe, advertising department, factory. 10—H. A. Bonnell, Bonnell Motor Car Co., Newark, N. J. 11—J. J. Lavery, J. J. Lavery & Co., New Haven. 12—Harry Gates, Bridgeport. 13—Frederick Gotier, Albany. 14—Edward H. Harris, Charter Oak Motor Car Co., Hartford. 15—Fred W. Nichols, eastern district manager. 16—Byron H. Riess, son of Mr. Riess. 17—H. A. Diuguid, Diuguid Bros., Brooklyn. 18—George L. Riess, son of Mr. Riess.



STUDEBAKER LUNCHEON TO DEALERS—1—E. R. Benson, vice-president and sales manager. 2—F. R. Bump, New York branch manager. 3—R. T. Hodgkins, assistant general sales manager, Detroit. 4—H. T. Myer, commercial car sales manager. 5—Branch Manager Jordon, Boston.

of the Firestone Tire & Rubber Co.

Moving picture films were shown of the Los Angeles-Phoenix desert race, in which the Paige finished second and third, and an amusing part of the program were films of President Jewett, Sales Manager Krohn and General Manager James F. Bourquin. These men were filmed in their offices at their desks and undoubtedly attempted to represent themselves in the normal duties of a day's business, but the film operator who turned the crank at the banquet speeded things up to a point where these factory dignitaries jumped about their offices with lightning-like moves and displayed all the activity of a loose connecting rod at 3,700 r. p. m.

HUPP MEN LOOKING UP

One of the events of the New York show week was a banquet given Thursday evening by Charles E. Riess, Hupmobile distributor, in the Della Robbia room of the Hotel Vanderbilt to Hupmobile dealers. Over 150 Hupmobile representatives were present, including the distributors from Cleveland, Pittsburgh and Boston, as well as P. H. Greer, distributor at Los Angeles, a close friend of Riess.

This is an annual event of the Riess organization and was the most successful affair of its kind that has as yet been staged by this New York distributor. A spirit of optimism prevailed among all

the dealers present; every one was unanimous in proclaiming bigger and better business for the coming year.

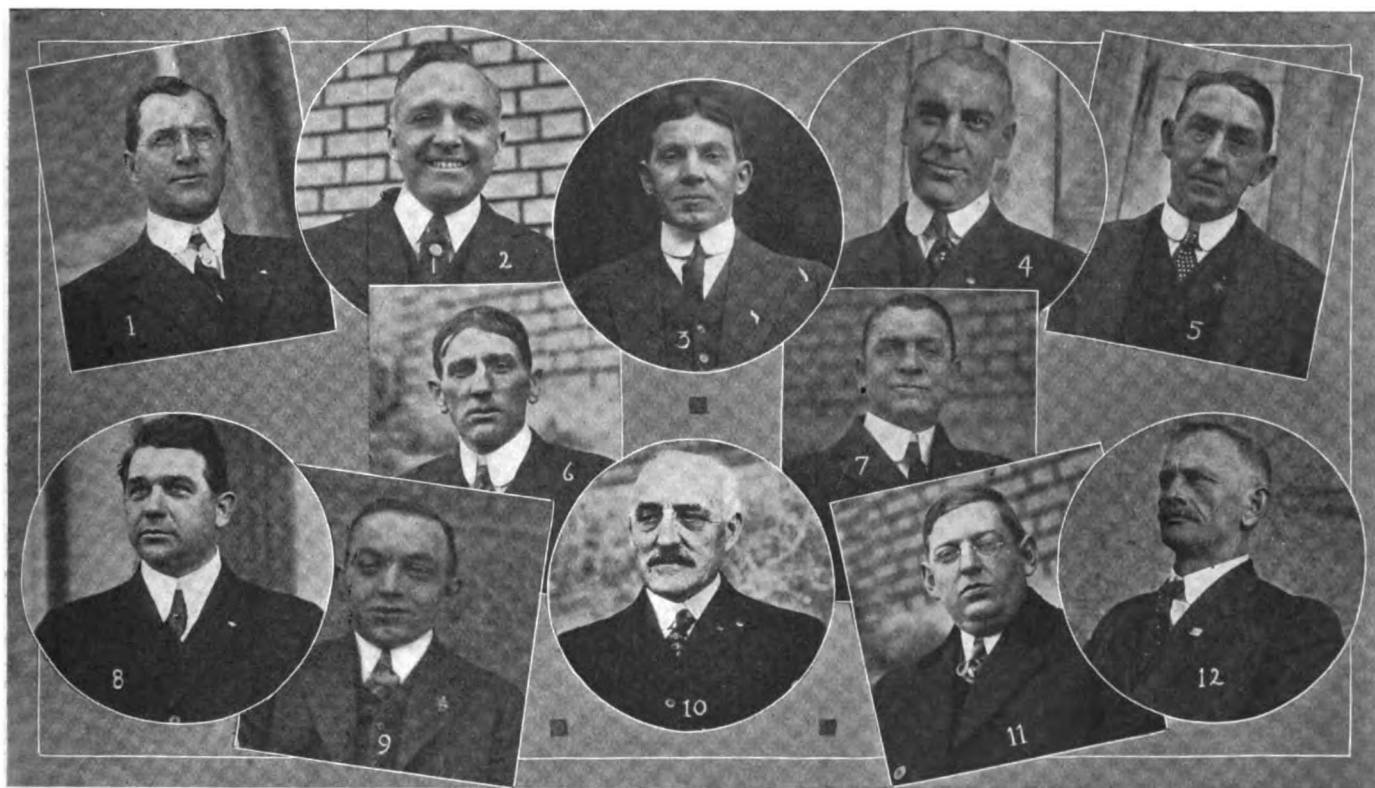
Lee Anderson, advertising manager, acted as toastmaster, and informal talks were given by Harry Fosdick, Boston distributor; W. C. Howard, assistant sales manager; C. J. Fox, Jr., service manager, and Mr. Greer, Los Angeles.

BENSON GIVES ADVICE

Better business methods were urged upon dealers by E. R. Benson, vice-president and sales manager, at the dealers' luncheon of the Studebaker Corporation at the Manhattan Tuesday noon. Benson, who is the author of a booklet on How



THE MAXWELL HEADQUARTERS IN THE BILTMORE—1—E. H. Roberts, special representative, zone 1, Maine to Washington, D. C. 2—W. D. Paine, supervisor of zone 4, Detroit. 3—A. Lustbaum, Andy's Garage, Long Branch, N. J. 4—H. G. Beran, salesman, zone 1. 5—J. L. Gillis, salesman, district 7, Syracuse. 6—H. J. Vogler, salesman, district 8, Philadelphia. 7—W. R. Hawks, salesman, district 6, Albany. 8—J. R. Garth, salesman, district 9, Philadelphia. 9—L. R. Peed, special representative, Detroit. 10—Walter Mason, Parkaley Automobile Co., Parkaley, Va. 11—M. Miller, factory. 12—M. Irwin, dealer, Little Falls, N. Y. 13—Ralph F. Coburn, salesman, district 3, Boston. 14—J. R. Potts, salesman, Charlotte, N. C.



BUICK MEN AT THE SHOW—1—F. R. Caulkins, Middletown, Conn. 2—Earl Glidden, New York city. 3—F. Brown, White Plains. 4—W. A. Rutz, New Haven. 5—W. L. Newton, New York city, retail sales manager, at branch. 6—Raymond, Paatz, Binghamton. 7—R. A. Ammerman, Scranton. 8—Herbert Lake, Danbury, Conn. 9—Bert Coleman, Athens, Pa. 10—Corey V. Searing, Patchogue, L. I. 11—Dick Ryerson, Middletown, N. Y.

to Make Money Selling Motor Cars, expressed his belief that dealers should abandon precedent when it is not the best and strike out into more modern paths.

He told the story of the calf that is reputed to have founded Boston—or to have at least laid out some of the streets; the story is that the calf made a path, as bovines will, that human beings, too, trod the path, that it became more or less a thoroughfare and marks the line of some of the present-day streets.

125 SAXON MEN DINE

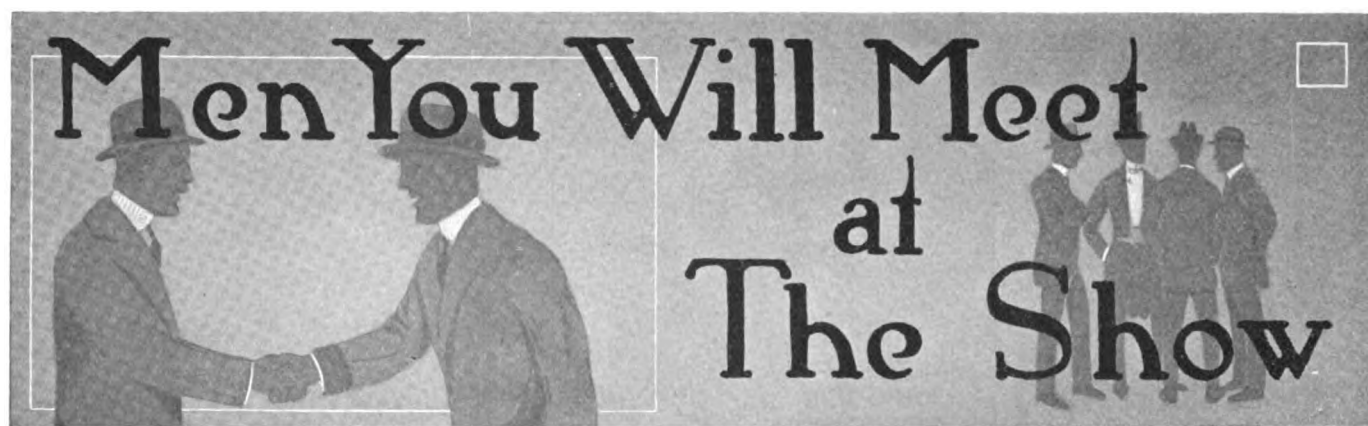
One hundred and twenty-five Saxon dealers lunched Thursday of show week at the Knickerbocker, and there was a prevailing spirit of better-business-in-1915. President Harry Ford of the Saxon Motor Co., Detroit, urged enthusiasm among the retailers in the field and said he believed 1915 was going to sweep away what clouds had accumulated in the past year.

Mingled with a cabaret program were talks by Lee Counselman, a director of the company, and Lawrence Moore, director of sales.

FRANKLIN AT McALPIN

The dealers' dinner of the Franklin Automobile Co. at the McAlpin Thursday evening developed into a heart-to-heart discussion of company policy and

(Continued on page 106)



The men whose names are listed herewith are makers' representatives who will be at the Chicago show in an official capacity. The name of the company, or car, appears first, followed by the hotel

at which the representatives make their headquarters. The men whose names appear before the second short dash (—) have been designated by their companies as the proper persons for dealers desir-

ing to transact business at the show to see. The others are additional company representatives and officials who will be present during the continuance of the show.

MOTOR CAR MAKERS

Allen—Congress—J. E. Wright, W. O. Allen, J. L. Allen, N. W. Mackey—E. J. Wright, R. G. Ewell.

Apperson—Congress—J. B. Eccleston, Genl. Sales Mgr.—H. A. Bauer, George H. Strout, J. H. Newmark.

Briggs—Detroit—Congress—W. C. Hood, Sales Mgr.—C. S. Briggs, S. W. Kidd, W. T. Miller, R. S. Smith.

Buckeye—Brevort—J. E. Burke, Field Sales Mgr., J. W. Lambert, Genl. Mgr., A. R. Lambert, Asst. Genl. Mgr.—H. P. Lambert, W. E. Vassinder.

Cadillac—Congress—E. C. Howard, Sales Mgr.—H. M. Leland, Pres., W. C. Leland, Vice-Pres., L. McNaughton, Asst. Sales Mgr., K. P. Drysdale, Adv. Mgr.; Dist. Rep.: E. C. Molitor, H. H. Pierce; E. C. Garland, Mgr. Technical Dept.

Chalmers—Blackstone—Hugh Chalmers, Lee Olwell, Percy Owen, J. E. Fields, E. W. Nicholson, G. Vernon Beck, L. L. Brockett, D. M. Lasley, J. H. Mackie.

Chandler—Annex—F. C. Chandler, C. A. Emise—S. Regarm, J. P. Winterson, S. Black.

Chevrolet—New Southern—A. B. C. Hardy, Genl. Mgr., L. D. Haas, Asst. Sales Mgr., F. K. Lane.

Cole—Lexington—C. P. Henderson, Genl. Sales Mgr., J. J. Cole, Pres.—R. P. Henderson, A. S. Blakesley, J. F. Richmond.

Crow—Annex—M. E. Hoshan, Sales Mgr., M. E. Crow, Pres.

Davis—Congress—C. C. Davis, Scott Lewis—George W. Davis, W. H. Cummins, B. C. Emerson, S. C. Riegel.

Dodge Bros.—Blackstone.

Elkhart—Ft. Dearborn—W. H. Patterson, F. L. Sherine, E. D. Patterson—F. E. Chase, C. S. Swoffield.

Haynes—Annex—R. Crawford, D. L. Watson—A. G. Seiberling, A. E. Starbuck.

Herff-Brooks—Congress—Herbert Herff—H. H. Brooks, George Herff, George S. Hart, John A. Bland.

Imperial—Auditorium—T. A. Campbell, George N. Campbell, Ben Schnur—F. E. Davis, J. E. Dougherty, F. W. Ellis.

Inter-State—New Southern—B. W. Twyman, Genl. Mgr.—T. J. Turk, Chief Engineer, E. B. Proudfoot, Sales Mgr., O. W. Lawson, L. H. Sackett, E. L. Jacoby, B. D. Arthur.

Lewis—La Salle and Annex—J. M. Cram, Vice-Pres., J. W. Gilson, Adv. Mgr.—D. E. Bull, L. W. Peterson, Edward C. Beyer.

McIntyre—Auditorium—J. D. Casey, Sales Mgr.

Maxwell—Blackstone—W. E. Flanders, Pres., W. W. Anthony, Compt., J. A. Vail, Board Chairman, C. H. Felton, Asst. to Pres., C. E. Steb-

bins, Asst. Sales Mgr., R. T. Walsh, Adv. Mgr., H. F. Harris, C. Gould, Serv. Mgr., A. E. Richmond, Serv. Supt. Supervisors—C. R. Newby, Zone No. 3; W. D. Paine, Zone No. 4; John Yoke, Zone No. 5; District Salesmen—L. K. Cooper, Chicago; D. R. Chapman, Milwaukee; L. F. Smith, Columbus; W. H. Long, Des Moines; R. L. McConaha, and R. I. Malkin, Indianapolis; L. A. Hannan and E. W. Fuhr, St. Louis; R. E. Wedekind, Nashville; William Turner and M. J. Williams, Kansas City; C. M. Strieby and H. H. Howe, Special Factory Representatives; L. P. Reed and Mr. Rowland.

Moline—C. H. Van Dervoort, Sales Mgr.—W. H. Van Dervoort, Pres., Eugene Grunewald, Chief Engineer, L. M. Bradley, Adv. Director.

Overland—La Salle—William G. Northrup and E. G. Hosler, special representatives—E. N. Culver, C. M. Leroux, C. H. Brooks, W. F. Wright, F. R. French, H. C. Russell, R. M. Fudge, D. R. Linsley, O. H. Mueller, R. E. Mull, C. A. Pennoyer, C. R. Nachtrieb, E. E. Redhead, J. R. Purnell, J. H. Quinlan, F. L. Walbrink.

Oakland—E. J. Kilborn, Dist. Sales Mgr., C. B. Voorhis, Asst. Sales Mgr., Fred W. Warner, Genl. Sales Mgr.—N. W. Wahlberg, Chief Engineer, W. D. Kelly, Produc. Mgr., H. R. Viot, Purchas. Agt.

Packard—Blackstone—H. H. Hills, A. E. Corbin, G. R. Bury—Alvan Macauley.

Pathfinder—Manhattan—L. E. Willson, Genl. Mgr., W. K. Bromley, Sec. & Treas.—W. C. Teasdale, Pres., Karl Feilcke, N. B. Reisinger, F. G. Buskirk.

Peerless—Congress Annex—R. J. Schmunk, W. W. Lewis, W. W. Baker—H. A. Tremaine, T. W. Frech, W. R. Strickland, G. E. Twitmyer, W. H. Staring.

Reo—Congress—R. C. Rueschaw, H. W. Lee, J. C. Brandimore, H. J. Staebler—R. H. Scott, D. E. Bates, H. T. Thomas, H. C. Teel, G. E. Smith.

Rauch & Lang Carriage Co.—Annex—C. L. F. Wieber, Pres. and Genl. Mgr., W. G. Pancoast, Sales Mgr., J. H. Hertner and D. C. Cookingham, Engineers, E. J. Stahl.

Stutz—New Southern.

Trumbull—New Southern—F. S. Trumbull, Vice-Pres.—R. E. Fuller.

Velie—Lexington—R. R. Bush, Genl. Mgr., G. H. Lloyd, Sales Mgr., L. E. Nutt, Sec'y, W. H. Morgan, Asst. Sales Mgr., H. T. Wheelock, Lee Hazard.

Waverley—New Southern—Roy A. Potts, Sales Mgr.—W. B. Corley, Pres., H. H. Rice, Vice-Pres., W. C. Johnson, Sec'y, P. W. Eigner, Edgar S. Salisman, C. W. Long.

ACCESSORY MAKERS

Ajax Trunk & Sample Case Co.—Palmer House—Sidney L. Hellendale.

American Express Co.—W. W. Chandler, Com. Agt., William Gourlay, Genl. Traffic Agt.

Arnold, N. B.—New Southern—M. A. Dewey, Jr.—Salesmen.

Autorecue Mfg. Co.—New Southern—Henry Gleim, F. C. Roettgen, George Daubner.

Automobile Supply Mfg. Co.—Congress—C. S. Shuman—Frederick Eisle, Ernest Rubes, F. C. Van Gieson.

Badger Brass Mfg. Co.—Congress—L. J. Keck, R. H. Welles, W. A. Bell.

Blackledge Mfg. Co., J. W.—New Southern—J. W. Blackledge, Pres., R. S. Wilttrout, Mgr.—S. W. Lanham, C. A. Quince, W. W. Douglas.

Braender Rubber & Tire Co.—La Salle—Leslie R. Pratt, W. P. Braender.

Buchanan Electric Steel Co.—La Salle—E. B. Ross.

Byrne, Kingston & Co.—Brevort—C. T. Byrnes, Vice-Pres., J. W. Johnson, Sec'y and Treas., J. P. Grace.

Celfor Tool Co.—La Salle—R. J. Burrows—E. C. Mogford, A. S. Webb.

Champion Ignition Co.—Annex—Albert Champion, Genl. Mgr.—E. H. Reynolds, C. E. Ohborne, B. de Guichard, Asst. Mgr.

Champion Spark Plug Co.—La Salle—F. B. Caswell, J. T. Moaltrup, W. B. Canis, H. W. Biddle, R. A. Stranahan, Pres., F. D. Stranahan, Treas.

Continental Motor Mfg. Co.—Blackstone—G. W. Yeoman, L. H. Earle.

Cowles & Co., C.—Great Northern—M. S. Bottum, C. A. Tournier.

Currier-Koeth Mfg. Co.—Dearborn—J. C. Smart, Sales Mgr., J. J. Comstock.

Curtis Pneumatic Machinery Co.—Great Northern—E. J. Clark—D. A. Wright.

Double Fabric Tire Co.—Auditorium—A. L. Murray, W. H. Willennar, R. B. Crane, C. E. Lyman, A. E. Holden, Lyman M. Bourne, C. C. Marston.

Findeisen & Kropf Mf. Co.—C. W. Findeisen, Sales Mgr., E. A. Bates, Adv. Mgr., Charles Rayfield, Frederick Purdy; Branch Managers: E. A. Rossow, Chicago; H. L. Dickey, New York; M. B. Fletcher, Detroit—N. H. Mottinger, W. A. Robbins, Charles K. Stern, Charles C. Merz, A. B. Hubbard, O. K. Wight.

Frasse & Co., Peter A.—New Southern.

Funke & Co., Herbert L.—Congress—H. F. L.

Funke, Pres.—H. M. Brigham, Sec'y.

Garage Equipment Mfg. Co.—Sherman House—W. H. Schwab—A. S. Clucker, C. L. Hixson, G. L. Discher.

Garford Mfg. Co.—Morrison—R. M. Allen, Mgr. Accessory Dept.; J. F. Goss, A. V. Overshiner, Geo. A. Scoville, W. C. Strong, W. H. Scott, A. J. Roberts.

Gray & Davis—Blackstone—William Gray, William H. Gray, Alexander Churchward, C. O. Sacks—Auditorium—C. M. Tichenor, R. W. Harris, E. E. Schwartzkopf, Kenneth Greenleaf, A. G. Haskell, W. W. Burk, D. H. Elkins, E. F. Wackwitz, C. B. Cattus.

Grossman Mfg. Co., Emil—New Southern—Emil Grossman, Pres., Joseph N. Lowe, Vice-Pres., Harry G. Wedder, A. E. Rosenberg, H. A. Smith.

Harris Oil Co., A. W.—R. B. Richardson, W. M. Kendrick.

Hartford Suspension Co.—La Salle—E. R. Waterman, Sales Mgr.—A. Waterman, Genl. Mgr., W. P. Pollitzer, Chicago Branch Mgr.

Heinze Electric Co.—New Southern—R. J. Legare, R. G. Sedley, A. R. Bliss—J. A. Legare, B. Ames.

Hydraulic Pressed Steel Co.—Congress—O. A. Parker, J. E. Maloney, George C. Brainard.

Kokomo Electric Co.—J. P. Grace—C. T. Byrne, Pres., J. W. Johnson, Treas.

Laidlaw Co.—Congress and Annex—William R. Laidlaw, H. T. Strong, James H. Johnson, Frank J. Partlan, Harry D. Cottell.

Leather Tire Goods Co.—C. B. Woodworth, D. A. Falkenburg, M. J. Moran.

Lipman Air Appliance Co.—La Salle—C. E. L. Lipman, Pres.—E. Lipman, Sec'y, W. M. Robinson, Asst. Engineer.

Lovell-McConnell Mfg. Co.—Blackstone—F. Hallett Lovell, Jr., Pres., W. O. Fenner, Sec'y.

Marathon Tire & Rubber Co.—New Southern—W. F. Ridge, Pres., E. L. Campion, Western sales manager.

Marvel Auto Supply Co.—New Southern—William Trostler, Manuel Bergman.

Mayo Mfg. Co.—New Southern—Franklin Mayo, H. G. Weakley, F. J. Gall.

Morrison-Ricker Mfg. Co.—Sherman—Benjamin J. Ricker.

Mossberg Co., Frank—Illinois Athletic Club—E. W. Scott, W. I. Tuttle, Sec'y-Treas., F. T. Chase, sales and advertising.

Events of the Week

Jan. 20—Briggs-Detroit Co.—Dealers' Meeting, Congress Hotel.

Jan. 21—Briggs-Detroit Co.—District Managers' Meeting, Congress Hotel.

Jan. 25-30—Maxwell Motor Co.—Special Dealers' Meetings, Blackstone Hotel, Daily.

Jan. 25—Chalmers Motor Co.—Dealers' and Salesmen's Meeting and Dinner, Auditorium.

Jan. 26—Garage Owners' Association of Illinois—Annual Meeting, Lexington Hotel.

Jan. 27—National Automobile Chamber of Commerce, Meeting.

Jan. 27-28—Garage Owners' Association of Illinois—Meeting to form National Garage Association, to be known as Associated Garages of America, Lexington Hotel.

Jan. 28—Crow Motor Car Co.—Dealers' Meeting, Annex.

Jan. 30—Chandler Motor Car Co.—Dinner, Annex.

Oakes Co.—Annex—W. D. Oakes, W. H. Oakes—Elbert Glass, Henry Enders, Carl Severson.

Positive Supply Co.—New Morrison—W. G. Sandford, Pres.—C. S. Hube, Vice-Pres., J. Reed Lane, Sec'y and Treas., P. A. Bendixen, Gen. Mgr., M. A. Hemming, Sales Mgr.

Pyrene Co.—Jirah D. Cole, Pres. and Genl. Mgr., J. K. Norstrom—B. K. Cosby, George Doscuer, T. B. Cady.

Randall-Faichney Co.—Alexander McIntosh—E. V. Noble, William A. Randall.

Remy Electric Co.—Annex—G. V. McMahan, E. R. Vincent—E. C. Borel, F. J. Urban, H. W. Griffith, E. L. Jones, O. F. Conklin, W. A. Kennington, J. W. Wood.

Royal Equipment Co.—S. Simpson, Pres., E. Everett, Sales Mgr., H. G. Farwell, Chief Engineer; Representatives: E. A. Wales, Chicago; A. P. McAleese, Pittsburgh; F. George Walker, Detroit.

Sager Co., J. H.—New Southern—J. H. Sager, C. J. Iven.

Standard Thermometer Co.—New Southern—S. H. Feigley, Sales Mgr., W. P. Reed—Walter J. Fleming, factory representative.

Standard Welding Co.—Blackstone—S. W. Hartley, Sales Mgr.

Standard Woven Fabric Co.—Great Northern—T. J. Daley—F. E. Sparks.

Stevens & Co.—La Salle—Louis Schwab, C. A. Bishop, E. C. Huntington.

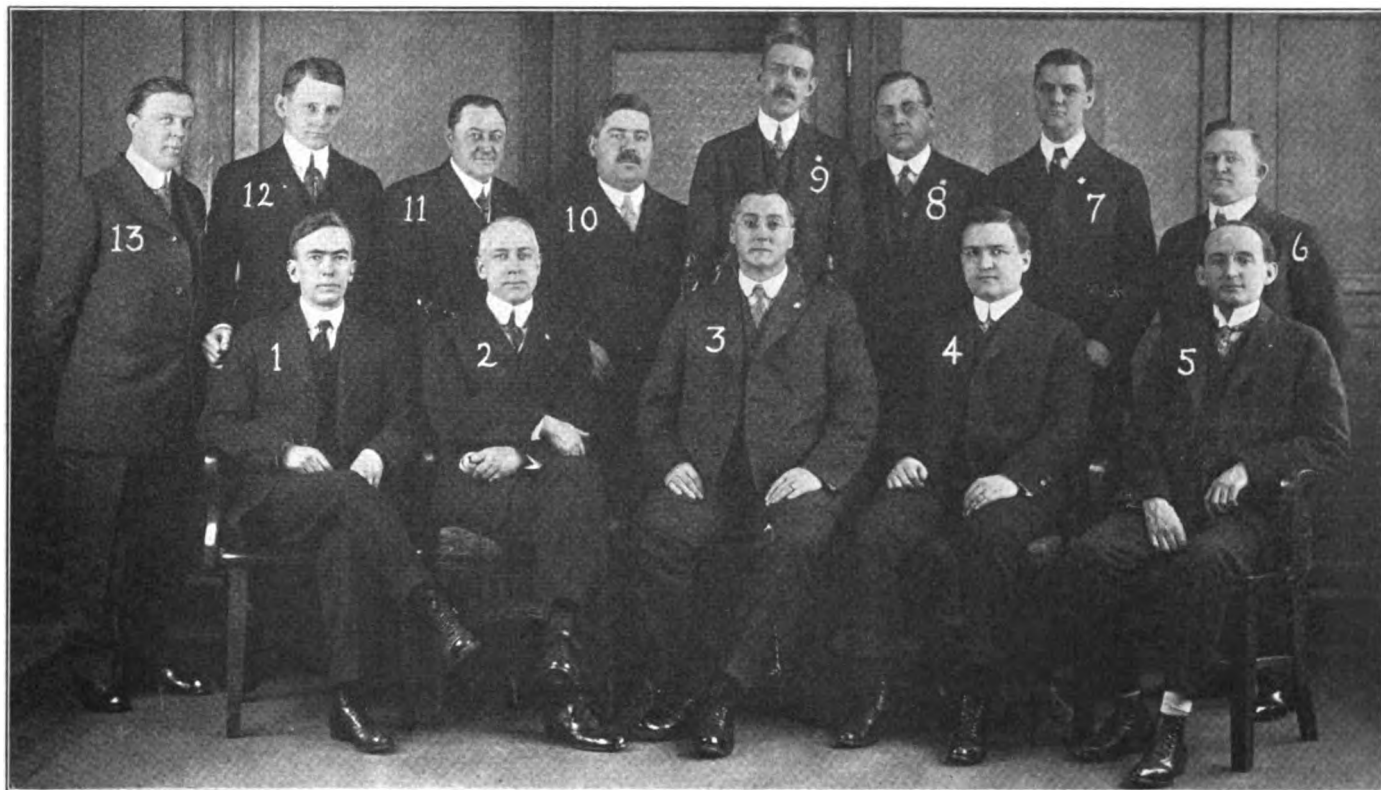
Stewart Auto Accessories Co.—F. W. Stewart, R. C. Spencer, H. Simmons—W. H. Storms.

Stewart-Warner Speedometer Corp.—W. J. Zucker, Sales Mgr., S. A. Douglas, Western Supervisor; Branch Managers: S. Kraus, Chicago; L. L. Banford, Indianapolis; J. B. Suess, Kansas City; J. C. Stiles, St. Louis; E. W. McGookin, Detroit—H. E. Weber, Berne Naddall, Webb Jay.

Triple Action Spring Co.—O. G. Temme, Pres. and Genl. Mgr., P. E. Reiners, Sales Mgr.—F. J. Rowan, Eastern Sales Representative.

Van Sicklen Co.—Congress Annex—N. H. Van Sicklen, Chas. F. Van Sicklen.

Warner Gear Co.—Congress Annex—H. J. Garceau, E. B. Baltzy—R. G. Johnson, Genl. Mgr., A. L. Johnson, Pres.



WESTINGHOUSE MEN AT THE SHOW—1—Frank Conrad, engineer, Pittsburgh. 2—W. K. Dunlap, assistant to vice-president, in charge of service, Pittsburgh. 3—G. Brewer Griffin, manager of automobile department, Pittsburgh. 4—G. H. Lewis, assistant manager, Pittsburgh. 5—S. L. Blackburn, Cleveland representative. 6—J. C. McQuistan, advertising manager, Pittsburgh. 7—A. W. Copley, engineer, Pittsburgh. 8—M. B. Hawxhurst, Detroit representative. 9—M. W. Hanks, Indianapolis representative. 10—S. D. Lewings, New York representative. 11—C. S. Whitney, Chicago representative. 12—C. B. Mills, engineer, Pittsburgh. 13—M. C. Turpin, press representative, Pittsburgh.

Simpler, Lighter 1915 Trucks

Modern Tendencies Emphasize Greater Chassis Flexibility, Worm Drive Propulsion Through Springs and Left Steer

THE progress that has been made in the truck field during the past year has as its outstanding features greater simplicity following a grouping of the units, an increase in flexibility of the frames and suspension, and the increasing popularity of worm drive.

Two hundred and fifty-three makers of gasoline and electric trucks and industrial electric trucks have entered their names as makers of commercial vehicles for 1915, and 30 of these are new. Fifty-seven have disappeared.

The most important of the changes that have been made is the rise in the use of worm drive, and this carries with it many secondary effects. In fact, the introduction of worm drive generally has meant the complete redesigning of the truck, and it follows that the machines equipped with this type of drive embody more improvements than the drive itself.

Shaft Drive Popular

Due, to some extent no doubt, to the practical elimination of the chain-driven passenger car, American buyers have a strong leaning toward the shaft in all its forms. While the chain still holds the balance of power in the offerings of truck manufacturers, shaft drive by worm, by bevel, by internal gear, and by double reduction combination spur and bevel has almost caught up, and it seems only a matter of time before these forms will supersede the chain. True flexibility of frame, which is now an accredited ideal of truck designers, is impossible with chain drive owing to the fact that the distance rods must rigidly separate the driving axle and the frame to keep the sprocket centers the correct distance apart. Of the different forms of shaft drive, the worm gear leads. Axle makers are in the main responsible for this.

Flexibility is easily obtained by the adoption of worm drive in place of chain. Instead of a jackshaft, gearset and motor all bolted more or less rigidly to a frame which must be heavy enough to carry these parts spread over it, the worm drive makers have in the main grouped the gearset, motor and clutch in one

unit, and mounted this unit on a flexible three-point suspension, leaving the frame free to weave and twist as required.

Flexibility has also been effected by taking the torque and propulsion through the vehicle springs instead of through radius rods and torque members. The

NEW TRUCKS ON THE 1915 MARKET

Aetna	Netco
Bingham	Old Hickory
Bulley	Paulding
C. T.	Power
Decatur	Reedsburg
Denby	Roland
Erie	Royal
Forschler	Safety First
Franklin	Saxon
Fremont-Mais	South Bend
Fuller	Trumbull
Harrison	Vim
Hercules	West Coast
Independent	Whitwood
Mansur	Wilson

use of tubular drive shafts in worm-driven vehicles of long wheelbase has eliminated the extra universal and bracket which is necessary with the two-part solid shafts.

Pressed Steel Frames

Flexibility has been further increased by the use of flatter springs and flexible frames, permitting the springs less throw and to be carried lower. Pressed steel frames are increasing in popularity following a cheapening of the process of manufacture, with the result that it is now possible to obtain a pressed steel frame at about the same figure as a frame built up from structural steel shapes. The pressed steel frame has the advantage of lightness and strength.

To illustrate the reduction in the number of parts which has been made in a great many cases the experience of one maker is cited. By eliminating radius rods and torque arms and driving through the springs, no less than 86 parts and 13 wearing surfaces have been done away with. Fifty-seven parts were rendered useless by the adoption of a center

control, with the levers on the gearbox. A reduction of 59 parts and 8 wearing surfaces was made by the substitution of a hollow torque tube for a solid shaft and an extra universal and supporting bracket. Eighty-six more parts and 11 wearing surfaces were cut out by the use of a unit power plant in place of a separate gearset. The total saving in parts over the same design last year, the latter being a chain drive, was 306. Oil holes were also reduced from about 60 to 50.

Single Ignition Increases

Single ignition and fixed spark have also had their part in simplifying the chassis. Accessibility has been increased by the compact grouping of the parts that has evinced itself as the trend and by the location of parts most needing attention where they are most easily reached. The necessity for adjustment and lubrication has been reduced by decreasing the number of wearing surfaces by distributing others so that group oiling is possible and to some extent by the use of self-oiling or magazine-oiled boxes.

Governors are now standard equipment, thus relieving the driver of the care of keeping the speed below a safe limit in the city and protecting the chassis from the evils of overspeeding. The standard speeds for trucks of different capacities vary from 16 miles per hour for a 5-ton truck to 5 miles per hour by a 10-ton truck.

In a cursory survey of the changes that have been made in existing lines and the new models that have appeared there are certain facts that stand out.

Worm drive has been adopted by Available, B. A. Gramm, Croce, Federal, Ideal, Independent, Modern, Moreland, Nelson & Le Moon, Old Reliable, Rowe, Service, Standard of Detroit, Velie and Sternberg. New trucks with worm drive are the Aetna, Morton, Netco, Old Hickory and Signal.

Four-wheel drive has been adopted by C. T. Walter, Golden West and Morton, making ten in all, these being added to the Couple-Gear, Duplex, Four-Wheel Drive, Jeffery, Nevada and Ware of last

year. Front drive is used by two trucks, the A. & B. and the M. & E. Auglaise has changed from internal gear drive to bevel. This is a 1,500-pound truck. Aetna is a newcomer with top worm drive.

Weight Steadily Decreases

There is a decided trend to lighter vehicles. This is well illustrated by the new 600-pound Brasie. Buick, maker of a 1,500-pound chassis, has discarded the L-head motor for a valve-in-head type which is standard Buick practice in the pleasure cars. The Mercury company has entered a new field by bringing out the Bulley tractor. It is a novel design in that it is mounted on three wheels with the motor located at the back, where its weight increases the traction. An ingenious toe-hitch allows 13 cars to be pulled around a corner in the same track.

Commerce trucks have been changed by the elimination of the friction drive and the substitution of a sliding gearset and cone clutch with bevel drive in the rear axle. Chase has eliminated the two-cycle, air-cooled motor, wood frame, full-elliptic springs, planetary gearset and high wheels except in one model, which is a 1,000-pound vehicle. The new models have a four-cylinder motor under the hood and chain or worm drive. Commerce has increased the capacity to 1,500 pounds and has put in a bigger motor.

Four-Wheel Drive has added a 6-ton model, which is the largest truck of this type ever built in this country, and G. M. C. has brought out a 1,500-pounder to round out its line of heavier vehicles.

Four-Wheel Knox Tractor

The Knox company is planning to bring out a tractor mounted on four wheels instead of three. Improvements have been made in the motor, and hydraulic brakes have been fitted, the advantage of these being that the strain of hand-braking a heavy tractor and set of trailers is removed from the driver.

Kisselkar is bringing out a 1,000-pound machine, and Lauth-Jergens has adopted internal gear drive, abandoning chain, and the name has been changed from Lauth-Jergens to Fremont-Mais. Locomobile has recently announced two lighter models of 2 and 3 tons to go with the single chassis 5-ton design of last year and has also put out a 6-ton truck. Mais has added a tractor of 16,000 pounds capacity. The Old Reliable company has made a 1½-ton to go with its line of heavier machines.

A 1-ton model is a new Packard offering and all Packard trucks now have left drive and center control. On its 1,500-

pound machines, Republic has adopted internal-gear drive instead of chain, which is standard on the others. This car is an entirely new model with motor under the hood.

Sanford is making a 1,500-pound car this year to sell with the 2,000- and 3,000-pound models, which are continued. Sternberg has brought out a 1,000-pound machine to go with its 2- to 7-ton line. Service has dropped friction drive in favor of a cone clutch and a sliding gearset. Transit has added a 1-ton model, the 2-ton model of last year being continued. Velie has brought out two lighter models, a 1- and 1½-ton.

Sliding Gearset in Wagenhals

Wagenhals has installed a sliding gearset in place of the planetary. The new gearset, transversely situated, is a special type, however, in which the driven shaft is a sleeve surrounding the drive shaft, thus bringing the sprocket close to the motor. Wilcox has added 1,000- and 2,000-pound models.

In analyzing the different trends in design, probably the most important single item is the tires, and it is found that the solid type leads with 87.5 per cent and pneumatic second with 11.33 per cent. Single tires are almost universal on front wheels, being standard on 98 per cent of the trucks, but on the rear, the field is nearly evenly divided, 51.5 being single and 48.5 dual.

As regards motor location, pleasure car practice is becoming more popular. Seventy-seven per cent have the motors placed under the hood, 13 per cent have them under the floor, 5.33 per cent between the seats, 3 per cent under seats and the remaining 1.66 per cent under the body.

Four-Cylinder Motors 96%

Ninety-six per cent of the motors have four cylinders, the two-cylinder finding favor with 3.33 per cent of the makers and the six and the three both being popular to the extent of .33 per cent. Block casting is used in 54 per cent of the motors; pairs find favor in 38 per cent, and single cylinders are used in only 7 per cent.

The L-head construction is common in 71 per cent of the motors, the T-head in 17.5 per cent, side and head 7 per cent, and all in head 3.5 per cent. The valve-in-head construction is not as popular as it is in pleasure cars apparently.

Cooling in three cases out of four is by means of a centrifugal pump; the gear pump is used in 5.5 per cent of the designs, and thermo-system, which is so popular on pleasure cars, is found on

only 17.66 per cent of the trucks. The finned tube radiator leads with a percentage of 42, the cellular type is second with 27.25 per cent, and the square tube has a popularity rating of 22 per cent.

Single ignition is employed on 54.25 per cent and dual on 41.25 per cent. Hand spark advance is still employed on the majority of the cars, 59.75 per cent being so equipped, but the fixed and automatic advance systems are gaining. Twenty-one and a quarter per cent are fixed and automatic is found on 17.33 per cent.

Centrifugal Governors Popular

Centrifugal governors are used on two machines out of every three; loose ball governors are used on 8.5 per cent of the machines, and suction governors on 7.5 per cent. Governor drive is from the motor in nine out of ten cases. No governors are fitted to 22 per cent of the machines.

Lubrication is by circulating splash on 52 per cent of the trucks, splash pressure on 34 per cent, non-circulating splash 7.75 per cent, and pressure 5.75 per cent.

Clutches are of all types, the cone being the most popular, however, with a percentage of 42.25; the dry disk is used on 28 per cent and the disk in oil on 17.75 and the dry-plate type on 8 per cent.

In seventy-eight per cent of the installations a selective gearset is standard, individual clutches being used in 8 per cent; progressive in 5.5 per cent and planetary and friction each about 2.5 per cent. The three-speed gearset is the most popular, with 82 per cent, four speeds and two speeds having 11.5 and 4.25 per cent, respectively.

Gearset location varies greatly. In 37 per cent it is in unit with the jackshaft, in 33 per cent in unit with the motor, and in 27 per cent it is situated amidships as a separate unit.

Chain Drive Still Leads

Despite the increase in worm and various other types of shaft drive, the chain is still the leader with a percentage of 57.5. Worm is found on 21.5 per cent of the trucks and bevel on 10. Internal gear is used on 7.25 and double reduction on only 2.25.

Left drive with center control is standard on 52 per cent, right drive with center control is found on 12.75, and right drive with right control on 29 per cent.

Radius rods are still used on 72 per cent of the models and the drive through springs has been adopted by 23 per cent of the makers.

Directory of Commercial Vehicle Makers

List of 253 Commercial Vehicles on 1915 Market Giving Names and Addresses of Makers and Catalog Capacities

Name	Manufacturer	Address	MODELS IN TONS CAPACITY																
			Figures do not refer to number of models																
			Under ½	½	¾	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7 and over	
A & B.	American & British Mfg. Co.	Providence, R. I.								3				5					
A & R.	Abendroth & Root Mfg. Co.	Newburgh, N. Y.								3		4		5					
Adams.	Adams Bros. Co.	Findlay, O.				1	1½	2											
Admiral.	Admiral Motor Car Co.	St. Louis, Mich.					1½												
Aetna.	Aetna Motor Truck Co.	Detroit, Mich.					1½		2½										
American.	American Motor Truck Co.	Detroit, Mich.				1													
American-Argo*.	American Electric Car Co.	Saginaw, Mich.	½			1													
Armleder.	O. Armleder Co.	Cincinnati, O.				1	1½	2											
Atlantic*.	Atlantic Vehicle Co.	Newark, N. J.	½			1		2			3½			5					
Atterbury.	Atterbury Motor Car Co.	Buffalo, N. Y.				1		2		3				5					
Auglaize.	Auglaize Motor Car Co.	New Bremen, O.																	
Autocar.	Autocar Co.	Ardmore, Pa.					1½												
Automatic**.	Automatic Transportation Co.	Buffalo, N. Y.				1		2											
Available.	Available Truck Co.	Chicago, Ill.				1		2											
Avery.	Avery Co.	Peoria, Ill.				1		2		3				5					
B. A. Gramm.	Gramm-Bernstein Co.	Lima, O.				1		2			3½			5					
Baker*.	Baker Motor Vehicle Co.	Cleveland, O.				1		2			3½			5					
Barker.	C. L. Barker	Norwalk, Conn.				1		2											
Bauer.	Bauer Machine Works Co.	Kansas City, Mo.																	
Beardsley*.	Beardsley Electric Co.	Los Angeles, Cal.				1													
Beaver*.	Beaver State Motor Co.	Portland, Ore.																	
Beck.	Beck & Son.	Cedar Rapids, Ia.					1½	2	2½										
Bessemer.	Bessemer Motor Truck Co.	Grove City, Pa.				1	1½	2											
Best.	Durant-Dort Carriage Co.	Flint, Mich.																	
Bingham.	Bingham Mfg. Co.	West Park, O.																	
Blair.	Blair Motor Truck Co.	Newark, O.						2		3		4		5					
Board.	B. F. Board Motor Truck Co.	Alexandria, Va.																	
Brasie.	Brasie Motor Truck Co.	Minneapolis, Minn.	½					2											
Brennan.	Brennan Mfg. Co.	Syracuse, N. Y.																	
Brockway.	Brockway Motor Wagon Co.	Cortland, N. Y.					1½	2											
Bucklen.	H. E. Bucklen, Jr. Motor Truck Co.	Elkhart, Ind.					1½		2½										
Buckwalter**.	Elwell-Parker Electric Co.	Cleveland, O.																	
Buffalo.	Buffalo Auto-Truck & Motor Co.	Buffalo, N. Y.																	
Buffalo*.	Buffalo Electric Vehicle Co.	Buffalo, N. Y.				1													
Buick.	Buick Motor Co.	Flint, Mich.																	
Bulley Tractor.	Mercury Mfg. Co.	Chicago, Ill.																T.	
Caldwell.	Empire Axle Co.	Dunkirk, N. Y.																	
Capitol*.	Capitol Truck Mfg. Co.	Denver, Col.																	
Carl*.	Carl Electric Vehicle Co.	Toledo, O.																	
Carlton.	Carlton-Hill Motor Car Co.	Rutherford, N. J.																	
Carroll.	Carroll Motor Car Co.	Strasburg, Pa.																	
Casey.	F. A. Casey Co.	Billerica, Mass.	½																
Chase.	Chase Motor Truck Co.	Syracuse, N. Y.		¾		1½				3									
Coleman.	Coleman Carriage & Hardware Co.	Ilion, N. Y.				1		2		3									
Commerce.	Commerce Motor Truck Co.	Detroit, Mich.																	
Connersville*.	Connersville Buggy Co.	Connersville, Ind.																	
Continental.	Continental Truck Mfg. Co.	Superior, Wis.					1½			3									
Corbitt.	Corbitt Auto Co.	Henderson, N. C.					1½												
Couple-Gear.	Couple-Gear Freight Wheel Co.	Grand Rapids, Mich.									3½			5					
Couple-Gear*.	Couple-Gear Freight Wheel Co.	Grand Rapids, Mich.									3½			5					
Cowan Transveor**.	Cowan Truck Co.	Holyoke, Mass.						2											
Crawford.	Crawford Automobile Co.	Hagerstown, Md.																	
Crescent.	Crescent Motor Truck Co.	Middletown, O.								3				5					
Croce.	Croce Auto Co.	Asbury Park, N. J.																	
Crown.	Crown Commercial Car Co.	North Milwaukee, Wis.					1½	2½											
C. T.	Commercial Truck Co. of America	Philadelphia, Pa.																	
C. T.*.	Commercial Truck Co. of America	Philadelphia, Pa.	½			1		2		3½				5					
Curtis.	Pittsburgh Machine Tool Co.	Braddock, Pa.						2		3									
Daimler, American.	General Vehicle Co.	Long Island City, N. Y.														6			
Dain.	Dain Mfg. Co.	Ottumwa, Ia.				1													
Dart.	Dart Motor Truck Co.	Waterloo, Ia.	½			1		2											
Dayton.	Durable Dayton Truck Co.	Dayton, O.				1						4							
Dayton*.	Dayton Electric Car Co.	Dayton, O.																	
Decatur.	Parcel Post Equipment Co.	Grand Rapids, Mich.	¾			1			2½										
DeKalb.	DeKalb Wagon Works.	DeKalb, Ill.					1½												
Denby.	Denby Motor Truck Co.	Detroit, Mich.				1													
Detroit*.	Anderson Electric Car Co.	Detroit, Mich.						2											
Diamond-T.	Diamond-T Motor Car Co.	Chicago, Ill.					1½			3									
Dispatch.	Dispatch Motor Car Co.	Minneapolis, Minn.																	
Doane.	Doane Motor Truck Co.	San Francisco, Cal.														6			
Dorris.	Dorris Motor Car Co.	St. Louis, Mo.						2											
Duffy.	Duffy Bros. Motor Truck Co.	San Francisco, Cal.																	
Dunlap*.	Dunlap Electric Co.	Columbus, O.	½																
Duplex*.	Duplex Power Car Co.	Charlotte, Mich.						2		3									
Durocar.	Amalgamated Motors Corp.	Alhambra, Cal.																	
Duryea.	Duryea Laboratories	Philadelphia, Pa.	½																
Dynamic**.	Cleveland-Galion Motor Truck Co.	Galion, O.																	
Eastern.	Eastern Power Truck Co.	Providence, R. I.																	
Edison*.	Edison Electric Vehicle Co.	Lawrence, Mass.																	
Electromobile**.	Electromobile Co.	St. Louis, Mo.				1	1½												
Elwell-Parker**.	Elwell-Parker Electric Co.	Cleveland, O.						2											

*Electric. **Electric industrial (indoor). †Steam

253 Trucks, Their Makers and Capacities

Name	Manufacturer	Address	MODELS IN TONS CAPACITY														
			Figures do not refer to number of models														
			Under 1/2	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7 and over
Erie	Erie Motor Truck Mfg. Co.	Erie, Pa.															
Evans	Evans Motor Car & Parts Mfg. Co.	Travers City, Mich.															
Fargo	Fargo Motor Car Co.	Chicago, Ill.			1												
Fawick	Fawick Motor Car Co.	Sioux Falls, S. D.		1			2										
Federal	Federal Motor Truck Co.	Detroit, Mich.				1 1/2											
Field*	Field Omnibus Co.	New York City															
Flint	Durant-Dort Carriage Co.	Flint, Mich.			1												
Forschler	Phillip Forschler Wagon Co.	New Orleans, La.				1 1/2											
Four Wheel Drive	Four Wheel Drive Auto Co.	Clintonville, Wis.					2		3						6		
Franklin	Franklin Commercial Truck Co.	Franklin, Pa.															
Fremont-Mais	Lauth-Juergens Motor Car Co.	Fremont, O.					2										
Fritchle*	Fritchle Automobile & Battery Co.	Denver, Col.															
Fuller	Fuller Power Truck Co.	Delphos, O.															
Gabriel	Gabriel Auto Co.	Cleveland, O.		1		1 1/2											
Garford	Willys-Overland Co.	Toledo, O.					2				4		5		6		
G. A. Schacht	G. A. Schacht Motor Truck Co.	Cincinnati, O.						3									
Gay	S. G. Gay Co.	Ottawa, Ill.			1												
Geneva	Geneva Wagon Co.	Geneva, N. Y.															
GMC	General Motors Truck Co.	Pontiac, Mich.				1 1/2	2			3 1/2			5				
GMC*	General Motors Truck Co.	Pontiac, Mich.			1	1 1/2	2		3		4		5		6		
Golden West	Golden West Motors Co.	Sacramento, Cal.															
Gramm	Gramm Motor Truck Co.	Walkerville, Ont.				1 1/2	2			3 1/2			5				
Great Eagle	United States Carriage Co.	Columbus, O.															
Great Southern	Great Southern Auto Co.	Birmingham, Ala.															
G.V.*	General Vehicle Co.	Long Island City, N. Y.			1		2			3 1/2			5				
G.V.**	General Vehicle Co.	Long Island City, N. Y.					2										
Hahn	Hahn Motor Truck Co.	Hamburg, Pa.															
Handy Wagon	Auburn Motor Chassis Co.	Auburn, Ind.		1													
Harrison	Robert Harrison Co.	South Boston, Mass.															
Harvey	Harvey Motor Truck Works	Harvey, Ill.				1 1/2			3								
Hercules	Hercules Motor Truck Co.	South Boston, Mass.															
Hoagland-Thayer**	Hoagland-Thayer, Inc.	Newark, N. J.					2						5T				
Homer	Homer Motors Co.	Los Angeles, Cal.															
Horner	Detroit-Wyandotte Motor Co.	Wyandotte, Mich.			1	1 1/2	2		3				5				
Hunt**	C. W. Hunt Co.	West New Brighton, N. Y.					2										
Hupmobile	Hupp Motor Car Co.	Detroit, Mich.															
Hurlburt	Hurlburt Motor Truck Co.	New York City			1		2			3 1/2							
Ideal	Ideal Auto Co.	Fort Wayne, Ind.			1	1 1/2		2 1/2									
IHC	International Harvester Corp.	Akron, O.															
Independent	Independent Motors Corp.	Port Huron, Mich.				1 1/2											
Indiana	Harwood-Barley Co.	Marion, Ind.				1 1/2			3				5				
Imp	W. H. McIntyre Co.	Auburn, Ind.															
Jeffery	Thomas B. Jeffery Co.	Kenosha, Wis.				1 1/2	2										
Juno	Juno Motor Truck Co.	Juneau, Wis.															
Kalamazoo	Kalamazoo Motor Truck Co.	Kalamazoo, Mich.				1 1/2											
Kanawha	Kanawha Auto Truck Co.	Charleston, W. Va.															
Kearns	Kearns Motor Car Co.	Beavertown, Pa.															
Kelly	Kelly-Springfield Motor Truck Co.	Springfield, O.			1		2			3 1/2			5				
King	A. R. King Mfg. Co.	Kingston, N. Y.								3 1/2							
Kisselkar	Kissel Motor Car Co.	Hartford, Wis.			1	1 1/2		2 1/2		3 1/2					6		
Kleiber	Kleiber Co., Inc.	San Francisco, Cal.				1 1/2		2 1/2		3 1/2			5				
Knox Tractor	Knox Motors Co.	Springfield, Mass.													6T		10T
Koehler	H. J. Koehler S. G. Co.	Newark, N. J.			1												
Kopp	Kopp Motor Truck Co.	Buffalo, N. Y.				1 1/2			3				5				
Kosmath	Kosmath Co.	Detroit, Mich.															
Krebs	Krebs Commercial Car Co.	Clyde, O.			1		2										
LaFrance	American LaFrance Fire Engine Co.	Elmira, N. Y.											5				
Lambert	Buckeye Mfg. Co.	Anderson, Ind.			1	1 1/2	2										
Lange	Lange Motor Truck Co.	Pittsburgh, Pa.				1 1/2		2 1/2									
Lansden*	Lansden Co., Ltd.	Brooklyn, N. Y.															
Lauth-Juergens	Lauth-Juergens Motor Car Co.	Fremont, O.			1		2		3				5				
Lewis	Lewis Motor Truck Co.	San Francisco, Cal.						2 1/2	3				5				
Lippard-Stewart	Lippard-Stewart Motor Car Co.	Buffalo, N. Y.			1	1 1/2	2										
Little Giant	Chicago Pneumatic Tool Co.	Chicago, Ill.			1												
Locomobile	Locomobile Co. of America	Bridgeport, Conn.							3		4		5		6		
Lord Baltimore	Lord Baltimore Motor Car Co.	Baltimore, Md.			1		2										
Maccar	Maccar Co.	Seranton, Pa.			1	1 1/2	2										
Mack	International Motor Co.	New York City			1								5		6		
M & E	Merchant & Evans	Philadelphia, Pa.								3 1/2			5				
Mais	Mais Motor Truck Co.	Indianapolis, Ind.				1 1/2	2	2 1/2	3								8T
Mansur	Mansur Motor Truck Co.	Haverhill, Mass.															
Marmon	Nordyke & Marmon	Indianapolis, Ind.															
Martin	Martin Carriage Works	York, Pa.			1	1 1/2		2 1/2		3 1/2							
McIntyre	W. H. McIntyre Co.	Auburn, Ind.				1 1/2			3								
Menominee	D. F. Poyer & Co.	Menominee, Mich.			1	1 1/2											
Mercury	Mercury Mfg. Co.	Chicago, Ill.															
Mercury Puller Tractor**	Mercury Mfg. Co.	Chicago, Ill.															T.
Milburn*	Milburn Wagon Co.	Toledo, O.															
Modern	Bowling Green Motor Truck Co.	Bowling Green, O.			1	1 1/2											
Mogul	Mogul Motor Truck Co.	St. Louis, Mo.					2				4				6		
Monitor	Monitor Automobile Works	Janesville, Wis.			1												
Moon	Joseph W. Moon Buggy Co.	St. Louis, Mo.				1 1/2											
Moore	Pacific Metal Products Co.	Torrance, Cal.				1 1/2	2		3		4		5				
Moore	Moore Motor Truck Co.	Philadelphia, Pa.								3 1/2							
Moreland	Moreland Motor Truck Co.	Los Angeles, Cal.				1 1/2	2	2 1/2		3 1/2			5		6 1/2		
Morton	Morton Truck & Tractor Co., Inc.	Harrisburg, Pa.				1 1/2	2	2 1/2	3	3 1/2			5		6		10T
Metokart	Metokart Co.	Seranton, Pa.															

*Electric. **Electric industrial (indoor). †Steam.

253 Trucks, Their Makers and Capacities

Name	Manufacturer	Address	MODELS IN TONS CAPACITY															
			Figures do not refer to number of models															
			Under $\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7 and over
Natco	National Motor Truck Co.	Bay City, Mich.				1												
Nelson & LeMoon	Nelson & LeMoon	Chicago, Ill.				1	1 $\frac{1}{2}$	2										
Netco	New England Truck Co.	Fitchburg, Mass.					1 $\frac{1}{2}$											
Nevada	Nevada Mfg. Co.	Nevada, Ia.								3								
New York	Tegetmeier & Riepe Co.	New York City					1 $\frac{1}{2}$											
O.K.	O. K. Motor Truck Co.	Detroit, Mich.					1 $\frac{1}{2}$											
Old Hickory	Kentucky Wagon Mfg. Co.	Louisville, Ky.					1 $\frac{1}{2}$											
Old Hickory*	Kentucky Wagon Mfg. Co.	Louisville, Ky.				1												
Old Reliable	Old Reliable Motor Truck Co.	Chicago, Ill.					1 $\frac{1}{2}$	2		3		4		5				7
Overland	Willys-Overland Co.	Toledo, O.	$\frac{1}{2}$															
Owosso	Owosso Motor Car Co.	Owosso, Mich.																
Packard	Packard Motor Car Co.	Detroit, Mich.						2		3		4		5		6		
Palmer	Palmer-Meyer Motor Car Co.	St. Louis, Mo.				1	1 $\frac{1}{2}$											
Palmer-Moore	Palmer-Moore Co.	Syracuse, N. Y.				1												
Paulding	St. Louis Motor Truck Co.	St. Louis, Mo.	$\frac{1}{2}$		$\frac{1}{2}$	1		2										
Peerless	Peerless Motor Car Co.	Cleveland, O.								3		4		5		6		
Perfex	Perfex Co.	Los Angeles, Cal.		$\frac{1}{2}$														
Phoenix	Phoenix Auto Works	Phoenixville, Pa.																
Pierce-Arrow	Pierce-Arrow Motor Car Co.	Buffalo, N. Y.						2						5				
Plymouth	Plymouth Motor Truck Co.	Plymouth, O.				1		2										
Power	Power Vehicle Co.	Milwaukee, Wis.																
Purity*	Purity Bread Co.	St. Paul, Minn.																
Reedsburg	Reedsburg Motor Truck Co.	Reedsburg, Wis.																
Reo	Reo Motor Truck Co.	Lansing, Mich.						2										
Republic	Republic Motor Truck Co.	Alma, Mich.				$\frac{1}{2}$	1	1 $\frac{1}{2}$										
Rockford	Rockford Motor Truck Co.	Rockford, Ill.																
Roland	Roland Gas Electric Vehicle Corp.	New York City					1			3	3 $\frac{1}{2}$							
Rowe	Rowe Motor Co.	Downington, Pa.						1 $\frac{1}{2}$	2		3							
Royal	Royal Motor Truck Co.	New York City									3 $\frac{1}{2}$			5				
Safety-First	Safety-First Motor Car & Truck Co.	Kalamazoo, Mich.																
Sandow	Sandow Truck Co.	Chicago, Ill.						1 $\frac{1}{2}$	2		3							
Sanford	Sanford Motor Truck Co.	Syracuse, N. Y.						1 $\frac{1}{2}$	2									
Saxon	Saxon Motor Co.	Detroit, Mich.	$\frac{1}{2}$															
Schleicher	Schleicher Motor Vehicle Co.	New York City						2		3					5			
Selden	Selden Motor Car Co.	Rochester, N. Y.						1 $\frac{1}{2}$	2									
Service	Service Motor Truck Co.	Wabash, Ind.				1	1 $\frac{1}{2}$	2		3				5				
Siebert	Siebert Motor Truck Co.	Toledo, O.				$\frac{1}{2}$												
Signal	Signal Motor Truck Co.	Detroit, Mich.					1											
Smith-Milwaukee	A. O. Smith Co.	Milwaukee, Wis.									3 $\frac{1}{2}$					6		
South Bend	South Bend Motor Car Works	South Bend, Ind.										4						
Speedwell	Speedwell Motor Car Co.	Dayton, O.						2										
Standard of Detroit	Standard Motor Truck Co.	Detroit, Mich.						2								6		
Standard of Ohio	Standard Motor Truck Co.	Warren, O.								3								7
Stanley	Stanley Motor Carriage Co.	Newton, Mass.				1	1 $\frac{1}{2}$	2			3 $\frac{1}{2}$							
Stegeman	Stegeman Motor Car Co.	Milwaukee, Wis.					1 $\frac{1}{2}$		2 $\frac{1}{2}$		3 $\frac{1}{2}$							
Sternberg	Sternberg Motor Truck Co.	Milwaukee, Wis.		$\frac{1}{2}$			1 $\frac{1}{2}$							5		6		7
Stewart	Stewart Iron Works	Covington, Ky.					1		2	3								
Stewart	Stewart Motor Corp.	Buffalo, N. Y.				$\frac{1}{2}$												
Storms*	Storms Electric Car Co.	Detroit, Mich.	$\frac{1}{2}$															
Studebaker	Studebaker Corp.	Detroit, Mich.																
Sullivan	Sullivan Motor Car Co.	Rochester, N. Y.						1 $\frac{1}{2}$										
Tiffin	Tiffin Wagon Co.	Tiffin, O.				$\frac{1}{2}$	1	2										
Toeppner	Toeppner Bros.	Bay City, Mich.																
Toledo	Toledo Motor Truck Co.	Toledo, O.																
Trabold	Trabold Motor Mfg. Co.	Johnstown, Pa.						2		3								
Transit	Transit Motor Car Co.	Louisville, Ky.				1									5			
Trumbull	Trumbull Motor Car Co.	Bridgeport, Conn.	$\frac{1}{2}$				1	2			3 $\frac{1}{2}$							
Tulsa	Tulsa Automobile & Mfg. Co.	Tulsa, Okla.				$\frac{1}{2}$	1	1 $\frac{1}{2}$										
Tuttle	Tuttle Motor Co.	Canastota, N. Y.																
United States	United States Motor Truck Co.	Covington, Ky.						2	2 $\frac{1}{2}$	3		4						
Universal	Universal Motor Truck Co.	Detroit, Mich.						1 $\frac{1}{2}$		3								
Urban*	Kentucky Wagon Mfg. Co.	Louisville, Ky.				$\frac{1}{2}$		1 $\frac{1}{2}$	2 $\frac{1}{2}$			4						
Van Winkle	Van Winkle Motor Truck Co.	Atlanta, Ga.																
Velie	Velie Motor Vehicle Co.	Moline, Ill.				1	1 $\frac{1}{2}$		2 $\frac{1}{2}$			4		5				
Vim	Touraine Co.	Philadelphia, Pa.		$\frac{1}{2}$														
Voltacar*	Cyco-Electric Car Co.	New York City	$\frac{1}{2}$															
Vulcan	Driggs-Seabury Ordnance Corp.	Sharon, Pa.							2 $\frac{1}{2}$		3 $\frac{1}{2}$		4 $\frac{1}{2}$		5 $\frac{1}{2}$			7 $\frac{1}{2}$
Wagenhals	Wagenhals Motor Car Co.	Detroit, Mich.	$\frac{1}{2}$															
Wagenhals*	Wagenhals Motor Car Co.	Detroit, Mich.	$\frac{1}{2}$															
Walker*	Walker Vehicle Co.	Chicago, Ill.		$\frac{1}{2}$		1		2	2 $\frac{1}{2}$		3 $\frac{1}{2}$							
Walter	Walter Motor Truck Co.	New York City													5		6	7 $\frac{1}{2}$
Ward*	Ward Motor Vehicle Co.	Mount Vernon, N. Y.	$\frac{1}{2}$	$\frac{1}{2}$		1		2			3 $\frac{1}{2}$			5				
Ware	Ware Motor Vehicle Co.	St. Paul, Minn.								3								
Washington	Washington Motor Car Co.	Hyattsville, Md.																
Waverley*	Waverley Co.	Indianapolis, Ind.	$\frac{1}{2}$	$\frac{1}{2}$		1		2			3 $\frac{1}{2}$			5		6		7
West Coast	West Coast Wagon Co.	Tacoma, Wash.																
White	White Co.	Cleveland, O.				$\frac{1}{2}$		1 $\frac{1}{2}$		3				5				
Whitwood	Whitwood Corp.	Weedsport, N. Y.																
Wichita	Wichita Falls Motor Co.	Wichita Falls, Texas				1		2			3 $\frac{1}{2}$							
Wilcox	H. E. Wilcox Motor Car Co.	Minneapolis, Minn.				$\frac{1}{2}$	1	2										
Willet	Willet Engine & Carburetor Co.	Buffalo, N. Y.						2		3								
Willys	Willys-Overland Co.	Toledo, O.																
Wilson	J. C. Wilson & Co.	Detroit, Mich.						2										
Witt-Will	Witt-Will Co.	Washington, D. C.				1		2				4						
Zimmerman	Zimmerman Mfg. Co.	Auburn, Ind.		$\frac{1}{2}$														

*Electric. **Electric industrial (indoor). †Steam.

Buyer's Guide to 1915 Motor Trucks

Principal Features of Truck Chassis, Classified According to Capacity

TRUCKS UNDER 1/2-TON CAPACITY

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive	Feature
Brasie.....Packet	600	\$375	100	Pneu.	10.00	Fric.	Dbl chn.	Price
Decatur.....VI	800	630	102	Pneu.	12.08	Selec.	Sing chn.	Rear spring
Handy Wagon, Jr....	500	390	65	Solid.	11.25	Plan.	Dbl chn.	Convertible
Handy Wagon.....	800	487.50	77	Solid.	13.60	Plan.	Dbl chn.	Convertible
Hupmobile.....HT	800	850	106	Pneu.	16.92	Selec.	Bevel.	Low floor
Lambert.....VI	800	900	106	Pneu.	22.50	Fric.	Sing chn.	Friction drive
Metokart.....1&2	500	365	60	Pneu.	10.53	Fric.	Sing chn.	Price
Overland.....81	800	850-c*	106	Pneu.	25.60	Selec.	Bevel.	Standard car
Paulling.....O	800	650	95	Pneu.	12.08	Selec.	Bevel.	Standard car
Saxon.....A2	400	395-c	96	Pneu.	11.23	Prog.	Bevel.	Price
Trumbull.....15D	500	395-c	80	Pneu.	13.37	Selec.	Bevel.	Price
Wagonhals.....	800	690-c	80	P&C	19.61	Plan.	Sing chn.	3-wheeler

TRUCKS OF 1/2-TON CAPACITY

Bauer.....A	1,000	\$900	100	Solid.	22.50	Selec.	Dbl-red.	Double-red. drive
Best.....A	1,200	750	78	Solid*	16.20	Fric.	Dbl chn.	Friction drive
Chase.....S	1,000	750	98	Solid.	2-cyc.	Plan.	Dbl chn.	2-cycle motor
Dart.....A	1,000	845	100	Pneu.	34.28	Selec.	Bevel.	Standard car
Gabriel.....K	1,000	1,200	112	Pneu.	19.61	Selec.	Bevel.	Standard car
Handy Wagon, Sr....	1,200	600	86	Solid.	18.10	Plan.	Dbl chn.	Convertible
IHC.....M	1,000	.....	90	Solid.	16.20	Ind-c.	Dbl chn.	High wheels
Kasmath.....14	1,000	850	110	Pneu.	19.61	Selec.	Bevel.	Standard car
Mercury.....P	1,000	.....	84	Solid.	14.50	Plan.	Dbl chn.	Air cooled
O.K.....C&D	1,200	875	112	Pneu.	19.61	Selec.	Bevel.	Standard car
Sternberg.....	1,000	850-c	88	Pneu.	12.08	Selec.	Worm.	Worm drive
Vim.....L&S	1,000	620	94	Pneu.	12.40	Selec.	Bevel.	Price
Wilcox.....T	1,000	1,000	115	Pneu.	19.61	Selec.	Bevel.	Standard car

TRUCKS OF 3/4-TON CAPACITY

Atterbury.....AW	1,500	\$1,800	118	Pneu.	19.61	Selec.	Worm.	Worm drive
Anglaise.....H	1,500	950	100	Solid.	22.10	Selec.	Bevel.	Governor
Anglaise.....D	1,500	950	100	Solid.	22.50	Selec.	Bevel.	Governor
Bauer.....B	1,500	1,150	110	Solid.	22.50	Selec.	Dbl-red.	Double red. drive
Breckway.....G	1,500	1,205	100	Solid.	19.61	Selec.	Dbl chn.	Wood frame
Buck.....C4	1,500	1,150	120	Pneu.	22.50	Selec.	Bevel.	Valves in head
Chase.....T	1,500	1,500	135	Solid.	19.61	Selec.	Worm.	Worm drive
Commerce.....S	1,500	875	107	Pneu.	19.61	Selec.	Bevel.	Cast radiator
Crown.....A	1,500	2,000	120	Pneu.	22.50	Selec.	Worm.	Worm drive
Denby.....A	1,500	1,500	120	Solid.	19.61	Selec.	Int-g.	Int-gear drive
Dorris.....1A4	1,500	1,950	132*	Pneu.	30.65	Selec.	Bevel.	Valves in head
Fargo.....E	1,500	750	100	Solid.	16.20	Fric.	Bevel.	Price
Gabriel.....H	1,500	1,600	126	Pneu.	22.50	Selec.	Bevel.	Standard car
Geneva.....B	1,500	700	96	Solid.	21.10	Plan.	Dbl chn.	Price
GMC.....15	1,500	1,090	122	Pneu.	19.61	Selec.	Bevel.	Standard car
Independent.....F	1,500	1,285	112*	Solid.	19.61	Selec.	Worm.	Worm drive
Jeffery.....1515	1,500	1,300	118	Pneu.	22.50	Selec.	Bevel.	Standard car
Kisselkar.....1500	1,500	1,500	125	Pneu.	29.00	Selec.	Bevel.	Standard car
Lambert.....V2	1,500	1,125	114	Pneu*	22.50	Fric.	Dbl chn.	Friction drive
Lippard-Stew.....B*	1,500	1,650	115*	Pneu.	22.50	Selec.	Bevel.	French hood
Lippard-Stew.....BW*	1,500	1,775	115*	Pneu.	22.50	Selec.	Worm.	Worm drive
McIntyre.....E	1,500	.....	120	Solid.	22.50	Selec.	Dbl chn.	Standard car
Monominee.....A3	1,500	1,125	112	Solid.	22.50	Selec.	Bevel.	Standard car
Morland.....7X	1,500	1,800	126	Solid*	22.50	Selec.	Worm.	Distillate fuel
Paulling.....H	1,500	950	120	Solid.	19.61	Selec.	Dbl chn.	Standard car

TRUCKS OF 3/4-TON CAPACITY—Continued

Republic.....1500	1,500	.....	124	Solid*	19.61	Selec.	Int-g.	Int-gear drive
Sanford.....O	1,500	1,290	120	Solid*	19.61	Selec.	Int-g.	Int-gear drive
Standard-O.....DX	1,500	1,700	.....	Pneu.	25.60	Selec.	Worm.	Worm drive
Stegeman.....B	1,500	1,600	125	Pneu.	22.50	Selec.	Bevel.	Standard car
Stewart.....B	1,500	1,500	124	Pneu.	19.61	Selec.	Bevel.	French hood
Studebaker.....5	1,500	985	108	Pneu.	19.61	Selec.	Bevel.	Price
Tiffin.....A	1,500	1,600	112	Solid.	22.50	Selec.	Dbl chn.	Standard car
White.....GBBE	1,500	2,100	133	Pneu.	22.50	Selec.	Bevel.	Standard car
Willet.....N	1,500	1,600	125	Pneu.	22.50	Selec.	Dbl-red.	Double red. drive
Willys.....65	1,500	1,350	120	P&S	27.20	Selec.	Dbl chn.	Tire equipment

TRUCKS OF 1-TON CAPACITY

Adams.....A	2,000	\$1,850	121*	Solid.	22.50	Selec.	Dbl chn.	French hood
Armstrong.....B	2,000	2,200	136	Pneu.	27.20	Selec.	Bevel.	High wheels
Atterbury.....BW	2,000	2,100	137	Solid.	22.50	Selec.	Worm.	Worm drive
Available.....	2,000	.....	Opt.	Solid.	19.61	Selec.	Worm.	Worm drive
Avery.....C	2,000	1,690	128	Solid.	27.20	Selec.	Dbl chn.	Standard car
B. A. Gramm.....1	2,000	1,750	130	Solid.	22.50	Selec.	Dbl chn.	Standard car
Barker.....U	2,000	2,000	130	Solid.	25.60	Selec.	Worm.	Worm drive
Bessemer.....C	2,000	1,250	108	Solid.	19.61	Selec.	Dbl chn.	Standard car
Breckway.....H	2,500	1,590	112*	Solid.	22.50	Selec.	Dbl chn.	Wood frame
Coleman.....D	2,000	1,950	112	Solid.	22.50	Selec.	Dbl chn.	Standard car
Corbett.....F	2,500	2,000	130	Solid.	22.50	Selec.	Dbl chn.	Made in South
Dart.....	2,000	1,400	114	Solid.	19.61	Selec.	Dbl chn.	Standard car
Dayton.....U	2,000	1,800	118*	Solid.	29.00	Selec.	Dbl chn.	.....
Decatur.....C	2,000	1,500	Opt.	Solid*	22.50	Selec.	Int-g.	Int-gear drive
Denby.....B	2,000	1,600	120	Solid.	19.61	Selec.	Int-g.	Int-gear drive
Fargo.....F	2,000	1,250	130	Solid.	22.50	Selec.	Dbl-red.	Double-red. drive
Flint.....C	2,000	1,285*	106	Solid.	22.50	Selec.	Dbl-red.	Double-red. drive
GMC.....VC	2,500	1,500	126	Solid.	19.61	Selec.	Dbl chn.	Cast radiator
Hornor.....1	2,000	2,000	145	Solid.	27.20	Selec.	Dbl chn.	French hood
Hurlburt.....1	2,000	1,500	120	Pneu.	22.50	Selec.	Worm.	Worm drive
Kelly.....K30	2,000	2,000	120*	Solid.	22.50	Selec.	Dbl chn.	French hood
Kisselkar.....1	2,000	1,850	140	Pneu.	32.40	Selec.	Bevel.	Standard car
Kochler.....1	2,000	725	90	Solid*	22.10	Plan.	Dbl chn.	Price
Krebs.....G	2,000	1,900	118	Solid.	22.50	Selec.	Worm.	Variable governor
Lambert.....V3	2,000	.....	120	Solid.	26.27	Fric.	Dbl chn.	Friction drive
Lippard-Stew.....H	2,000	2,000	145	Solid.	22.50	Selec.	Worm.	Worm drive
Little Giant.....H	2,000	1,350	110	Solid.	22.50	Selec.	Dbl chn.	Motor under floor
Maccar.....B	2,000	1,900	138*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Maccar.....E	2,000	1,900	138*	Solid.	27.20	Selec.	Worm.	Worm drive
Martin.....R	2,000	2,050	125	Solid.	25.60	Selec.	Dbl chn.	Standard car
Monominee.....B3	2,000	1,400	122	Solid.	25.60	Selec.	Dbl-red.	Double-red. drive
Modern.....L	2,000	1,750	136	Solid*	22.50	Selec.	Worm.	Worm drive
Nate.....20	2,000	1,025	104	Solid.	19.61	Selec.	Dbl chn.	Motor betw. seats
Nel. & LeMoon.....EI	2,000	1,800	Opt.	Solid.	22.50	Selec.	Worm.	Worm drive
Palmer-Moore.....D	2,000	1,300	102	Solid.	2-cyc.	Selec.	Dbl chn.	2-cycle motor
Paulling.....G	2,000	1,300	120	Solid.	25.60	Selec.	Dbl chn.	Standard car
Republic.....1	2,000	1,350	124	Solid.	22.50	Selec.	Dbl chn.	Standard car
Roland.....1	2,000	2,000	120	Solid.	22.50	Selec.	Dbl chn.	Gas-electric
Service.....W	2,000	2,000	135	Solid.	22.50	Selec.	Worm.	Worm drive
Signal.....D	2,000	1,400	120	Solid.	22.50	Selec.	Dbl chn.	Standard car
Signal.....DL	2,000	1,450	144	Solid.	22.50	Selec.	Dbl chn.	Standard car
Signal.....F	2,000	1,500	120	Solid.	22.50	Selec.	Worm.	Worm drive
Signal.....FL	2,000	1,550	144	Solid.	22.50	Selec.	Worm.	Worm drive
Standard-O.....A	2,000	1,700	134	Solid*	25.60	Selec.	Dbl chn.	Standard car
Standard-O.....AX	2,000	1,900	124	Solid*	25.60	Selec.	Worm.	Worm drive
Stewart-K.....C	2,000	1,100	96	Solid.	20.00	Plan.	Dbl chn.	Motor under seats
Tiffin.....G	2,000	2,000	128	Solid.	22.50	Selec.	Dbl chn.	Standard car
Trabold.....T	2,000	1,250	118	Solid.	19.61	Selec.	Worm*	Worm drive
Transit.....E	2,000	2,000	120*	Solid.	32.40	Selec.	Dbl chn.	Opt. motor locat'n
Velie.....X	2,000	2,000	129*	Solid*	34.28	Selec.	Dbl-red.	Double-red. drive
Wichita.....A	2,000	1,650	110	Solid.	16.92	Selec.	Dbl chn.	Standard car
Wilcox.....L	2,000	2,000	132	Solid*	27.20	Selec.	Dbl chn.	Standard car

TRUCKS OF 1 1/2-TON CAPACITY

Adams.....D	3,000	\$2,300	121*	Solid.	27.20	Selec.	Dbl chn.	French hood
Aetna.....1 1/2	3,000	2,150	158	Solid.	25.60	Selec.	Worm.	Worm drive

ABBREVIATIONS: General, *, with other options; Opt, optional. Price, -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; P&S, pneumatic in front, solid in rear; P&C, pneumatic in front, cushion in rear; C&S, cushion in front, solid in rear. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, electric. Final Drive, Bevel, direct bevel; Dbl-red, double-reduction bevel and spur; Int-g, internal-gear; Worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -4, to front wheels; -4, to all four wheels.

TRUCKS OF 1½-TON CAPACITY—Continued

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive	Feature
Armleder Autocar.....H	3,000	\$2,150	Opt.	Solid.	32.40	Selec.	Dbl chn.	High wheels
Autocar.....21F	3,000	1,850	97	Opt.	18.10	Prog.	Dbl-red.	Motor under
Bessemer Beck.....A	3,000	1,800	136	Solid.	27.20	Selec.	Dbl chn.	Standard car seat
Beck.....	3,000	1,600	130	Solid.	27.20	Selec.	Int-g.	Int-gear drive
Chase.....R	3,000	2,300	Opt.	Solid.	22.50	Selec.	Worm.	Worm drive
Continental.....F	3,000	1,700	144	Solid.	16.92	Selec.	Opt.	Standard car
Crown.....B	3,000	2,500	140	Solid.	25.60	Selec.	Worm.	Worm drive
DeKalb.....D1	3,000	1,950	134	Solid.	27.20	Selec.	Dbl chn.	Standard car
Federal.....GH	3,000	1,800	120*	Solid.	27.20	Selec.	Dbl chn.	Cast radiator
Federal GW-HW.....	3,000	1,900	120*	Solid.	27.20	Selec.	Worm.	Worm drive
Forscher.....1A	3,000	2,300	124*	Solid.	27.20	Selec.	Dbl chn.	Double frame
Gabriel Gramm.....M	3,000	2,300	144	Pneu.	27.20	Selec.	Bevel.	Standard car
Gramm.....1j	3,000	2,600	129	Solid.	22.50	Selec.	Dbl chn.	Motor betw. seats
Harvey.....F	3,000	1,800	130	Solid.	22.50	Selec.	Dbl chn.	Standard car
Independent.....E	3,000	1,850	122*	Solid.	22.50	Selec.	Dbl chn.	Standard car
Indiana.....B	3,000	1,800	135*	Solid.	22.50	Selec.	Dbl chn.	Standard car
Jeffery.....3015	3,000	1,650	130	Solid.	22.50	Selec.	Dbl chn.	Standard car
Kalamazoo.....B	3,000	1,590	126	Solid.	22.50	Selec.	Dbl chn.	Standard car
Kisselkar.....1j	3,000	2,100	132*	Solid.	29.00	Selec.	Dbl chn.	Standard car
Kleiber.....1	3,000	2,000	140*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Lambert.....V4	3,000	1,900	120	Solid.	32.40	Fric.	Dbl chn.	Friction drive
Lange.....C	3,000	2,250	125	Solid.	22.50	Ind-c.	Dbl chn.	Ind-clutch gearset
Lippard-Stew.....F	3,000	2,300	145*	Solid.	27.20	Selec.	Worm.	Worm drive
Maccar.....C	3,000	2,150	150*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Mais.....C	3,000	2,750	119	Solid.	25.60	Prog.	Int-g.	Int-gear drive
Mais.....D	3,000	2,800	132	Solid.	25.60	Prog.	Int-g.	Int-gear drive
Martin.....S	3,000	2,150	121	Solid.	25.60	Selec.	Dbl chn.	Standard car
McIntyre.....A	3,000	1,444	144	Solid.	27.20	Selec.	Dbl chn.	Standard car
Menominee.....C	3,000	1,800	130	Solid.	25.60	Selec.	Dbl-red.	Double-red. drive
Modern.....H	3,000	1,950	136*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Modern.....M	3,000	2,000	136*	Solid.	27.20	Selec.	Worm.	Worm drive
Moore.....B	3,000	1,800	125*	Solid.	22.50	Selec.	Dbl chn.	Standard car
Moore.....1j	3,000	1,950	145	Solid.	27.20	Selec.	Dbl chn.	Standard car
Moreland.....1X	3,000	2,050	120	Solid.	27.20	Selec.	Worm.	Distillate fuel
Nal. & LeMoon..E1j	3,000	2,000	Opt.	Solid.	27.20	Selec.	Worm.	Worm drive
Notes.....C	3,000	2,250	144	Solid.	27.20	Selec.	Worm.	Worm drive
New York.....L	3,000	2,000	129	Solid.	16.92	Selec.	Dbl chn.	Standard car
Old Hickory.....30W	3,000	1,900	110	Solid.	22.50	Selec.	Worm.	Worm drive
Old Reliable.....1j	3,000	2,250	138	Solid.	22.50	Selec.	Worm.	Worm drive
Republic.....1j	3,000	1,475	144	Solid.	22.50	Selec.	Dbl chn.	Price
Revo.....CW	3,000	2,450	144	Solid.	25.60	Selec.	Worm.	Worm drive
Sandow.....1j	3,000	1,900	125*	Solid.	22.50	Selec.	Dbl chn.	Standard car
Sanford.....K	3,000	1,660	106	Solid.	25.60	Selec.	Dbl chn.	Standard car
Sandow.....JB	3,000	2,000	150	Solid.	22.50	Selec.	Dbl chn.	Standard car
Service.....Q	3,000	1,975	150	Solid.	27.20	Selec.	Dbl chn.	Standard car
Standard-O.....B	3,000	1,800	132*	Solid.	25.60	Selec.	Dbl chn.	Standard car
Standard-O.....BX	3,000	2,100	134*	Solid.	25.60	Selec.	Worm.	Worm drive
Stegeman.....C&S	3,000	2,100	150	Solid.	22.50	Selec.	Dbl chn.	Chain cases
Sullivan.....G	3,000	1,600	129	Solid.	22.50	Selec.	Dbl chn.	Standard car
Universal.....C	3,000	1,950	132	Solid.	22.50	Selec.	Worm.	Worm drive
Valis.....U	3,000	2,250	140	Solid.	34.28	Selec.	Worm.	Worm drive
White.....TBC	3,000	3,000	145j	Pneu.	22.50	Selec.	Dbl-red.	Double-red. drive

TRUCKS OF 2-TON CAPACITY

Adams, E.....	4,000	\$2,500	140*	Solid.	27.20	Selec.	Dbl chn.	French hood
Armleder, E.....	4,000	2,500	Opt.	Solid.	32.40	Selec.	Dbl chn.	High wheels
Atterbury.....CW	4,000	2,800	153	Solid.	27.20	Selec.	Worm.	Worm drive
Available.....	4,000	2,800	Opt.	Solid.	27.20	Selec.	Worm.	Worm drive
Avery.....B	4,000	2,700	128	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
B. A. Gramm.....2	4,000	2,550	146	Solid.	29.00	Ind-c.	Worm.	Worm drive
Barker.....V	4,000	2,400	136	Solid.	25.60	Selec.	Worm.	Worm drive
Bessemer.....D	4,000	2,300	136	Solid.	27.20	Selec.	Worm.	Worm drive
Blair.....C1	4,000	2,850	114*	Solid.	27.20	Ind-c.	Worm.	Worm drive
Brasie...Twin City	4,000	1,350	104	Solid.	20.00	Plan.	Dbl chn.	Price
Brasie...Twin City	4,000	1,350	104	Solid.	22.50	Selec.	Dbl chn.	Price
Brockway.....1	4,000	1,875	120*	Solid.	27.20	Selec.	Dbl chn.	Wood frame
Coleman.....G	4,000	2,450	124	Solid.	22.50	Selec.	Dbl chn.	Motor under seats
Curtis.....	4,000	2,750	130	Solid.	27.20	Selec.	Dbl chn.	Motor under floor
Dart.....	4,000	1,800	130*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Dorris.....1A4	4,000	2,500	144*	Solid.	30.65	Selec.	Dbl chn.	Valves in head
Duplex.....C	4,000	2,800	130	Solid.	27.20	Selec.	Int-g.	4-wheel drive
Four Wheel Drive.G	4,000	3,400	124	Solid.	29.00	Selec.	Bevel-4	4-wheel drive
Fremont-Mais...O	4,000	1,700*	132*	Solid.	22.50	Prog.	Int-g.	Int-gear drive
Garford.....L	4,000	3,000	128*	Solid.	36.15	Selec.	Dbl chn.	Motor betw. seats
G. A. Schacht...2	4,000	2,800	138	Solid.	29.00	Selec.	Worm.	Worm drive
GMC.....SC	4,000	1,900	143	Solid.	25.60	Selec.	Dbl chn.	Standard car
Gramm.....2	4,000	3,600	128	Solid.	32.40	Selec.	Dbl chn.	Motor betw. seats

TRUCKS OF 2-TON CAPACITY—Continued

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive	Feature
Horner.....2	4,000	\$2,650	145	Solid.	27.20	Selec.	Dbl chn.	French hood
Harburt.....2	4,000	3,000	Opt.	Solid.	27.20	Selec.	Worm.	Worm drive
Jeffery.....4015	4,000	2,750	124	Solid.	22.50	Selec.	Int-g-4	4-wheel drive
Kelly.....K-35	4,000	2,750	144*	Solid.	22.50	Selec.	Dbl chn.	French hood
Krebs.....H	4,000	2,350	144*	Solid.	27.20	Selec.	Worm.	Variable governor
Lambert.....V5	4,000	2,300	120	Solid.	32.40	Fric.	Dbl chn.	Friction drive
Lippard-Stew.....G	4,000	2,600	158*	Solid.	27.20	Selec.	Worm.	Worm drive
Maccar.....F	4,000	2,400	150*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Maccar.....D	4,000	2,400	150*	Solid.	27.20	Selec.	Worm.	Worm drive
Mais.....E	4,000	2,950	132	Solid.	25.60	Prog.	Int-g.	Int-gear drive
Mais.....F	4,000	3,000	145	Solid.	25.60	Prog.	Int-g.	Int-gear drive
Moore.....2	4,000	2,500	163	Solid.	32.40	Selec.	Dbl chn.	Standard car
Nal. & LeMoon..E2	4,000	2,250	Opt.	Solid.	27.20	Selec.	Worm.	Worm drive
Packard.....2	4,000	2,800	120*	Solid.	26.39	Prog.	Dbl chn.	Standard car
Paulding.....M	4,000	1,950	145	Solid.	34.28	Selec.	Dbl chn.	Standard car
Pierce-Arrow...2	4,000	3,000	150*	Solid.	25.60	Selec.	Worm.	Worm drive
Ree.....J	4,000	1,650	130*	Solid.	27.20	Selec.	Dbl chn.	Knock-down rad.
Reve.....DW	4,000	2,800	150	Solid.	29.00	Selec.	Worm.	Worm drive
Sandow.....2	4,000	2,250	125*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Sanford.....L	4,000	1,910	118	Solid.	27.20	Selec.	Dbl chn.	Motor under floor
Sanford.....M	4,000	1,910	140	Solid.	27.20	Selec.	Dbl chn.	Standard car
Service.....P	4,000	2,375	150	Solid.	27.20	Selec.	Dbl chn.	Standard car
Service.....PW	4,000	2,500	160	Solid.	27.20	Selec.	Worm.	Worm drive
South Bend.....40	4,000	2,000	136*	Pneu*	26.50	Selec.	Dbl chn.	Standard car
Speedwell.....8Y	4,000	2,850	115	Solid.	27.20	Selec.	Dbl chn.	Motor under floor
Standard-O.....C	4,000	2,000	144*	Solid*	25.60	Selec.	Dbl chn.	Standard car
Stenberg.....	4,000	2,800	148*	Solid.	22.50	Ind-c.	Worm.	Worm drive
Trabold.....	4,000	2,450	130	Solid.	27.20	Selec.	Worm*	Worm drive
Transit.....F	4,000	2,850	144	Solid.	32.40	Selec.	Dbl chn.	Opt. motor locat'n
U. S.....E	4,000	2,550	132	Solid.	27.20	Ind-c.	Dbl chn.	Ind.-clutch gear'st
Wichita.....B	4,000	2,100	118	Solid.	19.61	Selec.	Dbl chn.	Standard car
Wilcox.....NA	4,000	2,500	118	Solid.	29.00	Selec.	Dbl chn.	Motor under floor
Willet.....L	4,000	2,600	144	Solid.	27.20	Selec.	Dbl chn.	French hood
Wilson.....B	4,000	1,800	130*	Solid.	27.20	Selec.	Dbl chn.	Standard car

TRUCKS OF 2½-TON CAPACITY

Aetna.....2j	5,000	\$2,400	158	Solid.	34.28	Selec.	Worm.	Worm drive
Beck.....	5,000	1,850	130	Solid.	40.00	Selec.	Int-g.	Int-gear drive
Crown.....C	5,000	3,000	150	Solid.	29.00	Selec.	Worm.	Worm drive
DeKalb.....D2	5,000	2,450	136	Solid.	27.50	Selec.	Dbl chn.	Standard car
Kisselkar.....2j	5,000	2,750	144*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Kleiber.....2	5,000	2,750	150*	Solid.	27.20	Selec.	Dbl chn.	Standard car
Lange.....B	5,000	3,000	136	Solid.	27.20	Ind-c.	Dbl chn.	Ind.-clutch gear'st
Lewis.....21	5,000	2,900	144	Solid.	29.00	Ind-c.	Dbl chn.	Ind.-clutch gear'st
Mais.....G	5,000	3,200	145	Solid.	29.60	Prog.	Int-g.	Int-gear drive
Martin.....E	5,000	3,000	135	Solid.	27.20	Selec.	Dbl chn.	Motor under floor
Moreland.....2X	5,000	2,650	144	Solid.	32.40	Selec.	Worm.	Distillate fuel
Stegeman.....	5,000	2,800	142	Solid.	29.00	Selec.	Dbl chn.	Chain cases
U. S.....G	5,000	2,750	138	Solid.	27.20	Ind-c.	Dbl chn.	Ind.-clutch gear'st
Valis.....	5,000	2,850	148*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Vulcan.....2	5,000	2,750	150*	Solid.	29.99	Selec.	Dbl chn.	English design

TRUCKS OF 3-TON CAPACITY

A&B.....3-T	6,000	.....	144	Solid.	42.78	Elec.	Int-g-4	Gas-electric
Atterbury.....DW	6,000	\$3,800	168	Solid.	32.40	Selec.	Worm.	Worm drive
Avery.....A	6,000	2,500c	140	Wood.	36.15	Selec.	Dbl chn.	Farm truck
Avery.....B	6,000	3,200	128	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Blair.....B1	6,000	3,250	120*	Solid.	36.15	Ind-c.	Worm.	Worm drive
Chase.....O	6,000	3,300	175	Solid.	32.40	Selec.	Worm.	Worm drive
Coleman.....H	6,000	3,000	134	Solid.	27.20	Selec.	Dbl chn.	Motor under seat
Continental.....G	6,000	2,700	144	Solid.	16.92	Selec.	Opt.	Standard car
Crawford.....	6,000	3,000	144	Solid.	32.40	Selec.	Dbl chn.	Standard car
Curtis.....	6,000	3,250	130	Solid.	27.20	Selec.	Dbl chn.	Motor under floor
Duplex.....D	6,000	3,200	130	Solid.	29.00	Selec.	Int-g-4	4-wheel drive
Four Wheel Drive.B	6,000	4,000	124	Solid.	36.15	Selec.	Bevel-4	4-wheel drive
Garford.....J	6,000	3,500	128*	Solid.	36.15	Selec.	Dbl chn.	Motor betw. seats
G. A. Schacht...3	6,000	3,200	150	Solid.	29.00	Selec.	Worm.	Worm drive
Harvey.....H	6,000	3,000	168	Solid.	29.00	Selec.	Dbl chn.	Standard car
Horner.....3	6,000	3,200	145	Solid.	32.40	Selec.	Dbl chn.	French hood
Indiana.....F	6,000	2,500	144	Solid.	29.00	Selec.	Dbl chn.	Standard car

ABBREVIATIONS: General, *, with other options; Opt, optional. Price, -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; P&S, pneumatic in front, solid in rear; P&C, pneumatic in front, cushion in rear; C&S, cushion in front, solid in rear. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, electric. Final Drive, Bevel, direct bevel; Dbl-red, double-reduction, bevel and spur; Int-g, internal-gear; Worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -

TRUCKS OF 3-TON CAPACITY—Continued

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive	Feature
Lewis 31	6,000	\$3,250	144	Solid.	29.00	Ind-c.	Dbl chn.	Opt. motor locat'n
Locomobile 3	6,000	3,500	150*	Solid.	29.00	Selec.	Worm...	Worm drive
Mais H	6,000	3,400	160	Solid.	29.69	Prog.	Int-g.	Int-gear drive
McIntyre G	6,000	144	Solid.	27.20	Selec.	Dbl chn.	Standard	Standard car
Moore 3	6,000	3,150	142	Solid.	32.40	Selec.	Dbl chn.	Motor under floor
Old Reliable 3	6,000	3,400	122	Solid.	29.00	Selec.	Dbl chn.	Motor under floor
Packard 3	6,000	3,400	126*	Solid.	32.40	Prog.	Dbl chn.	Standard car
Peerless 3	6,000	3,700	151*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Roland 3	6,000	3,500	144	Solid.	29.00	Elec.	Worm...	Gas-electric
Rowe EW	6,000	3,400	156	Solid.	25.60	Selec.	Worm...	Worm drive
Sandow 3	6,000	3,000	147*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Service H	6,000	2,975	171	Solid.	29.00	Selec.	Dbl chn.	Standard car
Standard-D 3	6,000	2,750	144	Solid.	32.40	Prog.	Worm*	Worm drive opt.
Sternberg 3	6,000	3,400	158*	Solid.	29.00	Ind-c.	Worm...	Worm drive
Trabold 3	6,000	3,300	130	Solid.	29.00	Selec.	Worm*	Worm drive
U. S. D	6,000	3,200	144	Solid.	32.40	Ind-c.	Dbl chn.	Ind.-clutch gear's
Universal A	6,000	3,400	132	Solid.	25.60	Selec.	Dbl chn.	Motor under floor
Ware 6,000				Solid.	25.60		Bevel.	4-wheel drive
White TAD	6,000	3,700	163	Solid.	22.50	Selec.	Dbl chn.	Standard car
Wilcox JA	6,000	3,250	128	Solid.	29.00	Selec.	Dbl chn.	Motor under floor
Willet K	6,000	2,800	144	Solid.	32.40	Selec.	Dbl chn.	French hood

TRUCKS OF 3½-TON CAPACITY

B. A. Gramm 3½	7,000	\$3,400	158	Solid.	29.00	Ind-c.	Worm...	Worm drive
Couple-Gear ... H.C	7,000	4,850	144	Solid.	44.20	Elec.	Bevel-4.	Gas-electric
GMC HU	7,000	2,500	158	Solid.	40.00	Prog.	Dbl chn.	Standard car
Gramm 3½	7,000	4,600	140	Solid.	32.40	Selec.	Dbl chn.	Motor betw. seats
Harburt 3½	7,000	3,500	Opt.	Solid.	29.00	Selec.	Worm...	Worm drive
Kelly K-40	7,000	3,400	150*	Solid.	32.40	Selec.	Dbl chn.	French hood
King 3½	7,000	3,200	120	Solid.	32.40	Ind-c.	Dbl chn.	Motor under floor
Kisselkar 3½	7,000	3,350	162	Solid.	38.25	Selec.	Dbl chn.	Standard car
Kleiber 3	7,000	3,300	160*	Solid.	32.40	Selec.	Dbl chn.	Standard car
M & E B	7,000	3,350	132	Solid.	32.40	Selec.	Dbl chn.	Front drive
Martin L	7,000	3,500	145	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Moreland 3X	7,000	3,500	168	Solid.	36.15	Selec.	Worm...	Distillate fuel
Roland 3½	7,000	3,500	156	Solid.	32.40	Elec.	Dbl chn.	Gas-electric
Royal B3½	7,000	3,400	132	Solid.	36.15	Ind-c.	Dbl chn.	Motor under floor
Smith A	7,000	3,750	168	Solid.	40.00	Ind-c.	Worm...	Worm drive
Standard-O C	7,000	3,200	162	Solid.	30.65	Selec.	Dbl chn.	Standard car
Stegeman 3	7,000	3,350	155*	Solid.	32.50	Selec.	Dbl chn.	Chain cases
Transit T	7,000	3,500	144	Solid.	32.40	Selec.	Dbl chn.	Opt. motor locat'n
Vulcan 3	7,500	3,250	156*	Solid.	29.99	Selec.	Dbl chn.	English design
Wichita H	7,000	3,250	165	Solid.	29.00	Selec.	Dbl chn.	Standard car

TRUCKS OF 4-TON CAPACITY

Blair E1	8,000	\$3,750	135*	Solid.	36.15	Ind-c.	Worm...	Worm drive
Dayton A	8,000	2,700	136	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Garford K	8,000	3,850	128*	Solid.	36.15	Selec.	Dbl chn.	Motor betw. seats
Locomobile 4	8,000	3,650	150*	Solid.	29.00	Selec.	Worm...	Worm drive
Moore 4	8,000	3,500	153	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Old Reliable 4	8,000	4,000	126	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Packard 4	8,000	3,500	126*	Solid.	32.40	Prog.	Dbl chn.	Standard car
Peerless 4	8,000	4,000	151*	Solid.	32.40	Selec.	Dbl chn.	Standard car
South Bend 80	8,000	3,000	152	Pneu*	44.20	Selec.	Dbl chn.	Standard car
Speedwell 102	8,000	3,750	115	Solid.	40.00	Selec.	Dbl chn.	Motor under floor
U. S. F	8,000	3,550	156	Solid.	32.40	Ind-c.	Dbl chn.	Ind.-clutch gear's
Valie Z	8,000	3,350	148*	Solid.	32.40	Selec.	Dbl chn.	Standard car

TRUCKS OF 4½-TON CAPACITY

Vulcan 4½	9,200	\$4,000	162	Solid.	29.99	Ind-c.	Dbl chn.	English design
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TRUCKS OF 5-TON CAPACITY

A & B S-T	10,000		144	Solid.	42.76	Elec.	Int-g-f.	Gas-electric
Atterbury E	10,000	\$4,000	153	Solid.	38.25	Selec.	Dbl chn.	Standard car
Avery B	10,000	4,500	128	Solid.	44.20	Selec.	Dbl chn.	Motor under floor
B. A. Gramm 5	10,000	4,300	168	Solid.	40.80	Ind-c.	Dbl chn.	Ind.-clutch gear's
Blair, F. 5	10,000	4,500	135*	Solid.	36.15	Ind-c.	Worm...	Worm drive
Couple-Gear ... AC	10,000	5,400	144	Solid.	53.00	Elec.	Bevel-4.	Gas-electric
C. T. 10,000			155	Solid.	25.60	Elec.	Dbl red-4	Gas-electric
GMC KU	10,000	3,000	158	Solid.	40.00	Prog.	Dbl chn.	Standard car
Garford D	10,000	4,500	128*	Solid.	29.00	Selec.	Dbl chn.	Motor betw. seats
Gramm 5	10,000	5,350	140	Solid.	32.40	Selec.	Dbl chn.	Motor betw. seats
Horne 5	10,000	4,200	156	Solid.	44.20	Selec.	Dbl chn.	French hood
Indiana K	10,000	3,200	165	Solid.	36.15	Selec.	Dbl chn.	Standard car
Kelly K-50	10,000	4,250	150*	Solid.	32.40	Selec.	Dbl chn.	French hood
Kleiber 5	10,000	4,000	170*	Solid.	40.00	Selec.	Dbl chn.	Standard car
LaFrance 6	10,000	5,500	140	Solid.	48.48	Hyd.	Dbl chn.	Hydraulic drive
Locomobile A2	10,000	4,500	140*	Solid.	40.00	Selec.	Dbl chn.	Motor under floor
M & E G	10,000	2,750	116	Sol.-st.	29.00	Selec.	Dbl chn.	Front drive
Moore 5	10,000	4,500	175	Solid.	44.20	Selec.	Dbl chn.	Motor under floor
Moreland 5X	10,000	4,000	168	Solid.	36.15	Selec.	Dbl chn.	Distillate fuel
Old Reliable 5	10,000	4,000	126	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Packard 5	10,000	4,150	144*	Solid.	40.00	Prog.	Dbl chn.	Standard car
Peerless 5	10,000	4,500	151*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Pierce-Arrow 5	10,000	4,500	168*	Solid.	38.25	Selec.	Worm...	Worm drive
Rowe GW	10,000	4,500	171	Solid.	36.15		Worm...	Worm drive
Royal A5	10,000	4,500	138	Solid.	36.15	Ind-c.	Dbl chn.	Motor under floor
Service HX	10,000	4,000	175	Solid.	36.15	Selec.	Dbl chn.	Standard car
Stegeman 10,000		4,200	168	Solid.	32.40	Selec.	Dbl chn.	Chain cases
Sternberg 10,000		4,500		Solid.	32.40	Ind-c.	Worm...	Worm drive
Transit V	10,000	4,500	144*	Solid.	32.40	Selec.	Dbl chn.	Opt. motor locat'n
Valie Z5	10,000	3,750	148*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Walter 5	10,000	4,500	144	Solid.	30.65	Selec.	Int-g-4	4-wheel drive
White TCD	10,000	4,500	165	Solid.	29.00	Selec.	Dbl chn.	Standard car

TRUCKS OF 5½-TON CAPACITY

Vulcan 5½	11,005	\$4,500*	162	Solid.	29.99	Ind-c.	Dbl chn.	English design
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TRUCKS OF 6-TON CAPACITY

Daimler-Amer. ... FV	12,000		169	Solid.	29.00	Selec.	Int-g....	German design
Four Wheel Drive. M	12,000	\$4,800	148	Solid.	44.20	Selec.	Bevel-4.	4-wheel drive
Garford F	12,000	4,850	128*	Solid.	29.00	Selec.	Dbl chn.	Motor betw. seats
Kisselkar 6	12,000	4,350	168	Solid.	38.25	Selec.	Dbl chn.	Standard car
Knos-Tractor ... 31	12,000	3,250	139	Solid.	40.00	Selec.	Dbl chn.	3-wheeler
Locomobile ... AA2	12,000	4,800	140*	Solid.	40.00	Selec.	Dbl chn.	Motor under floor
Packard 6	12,000	4,300	144*	Solid.	40.00	Prog.	Dbl chn.	Standard car
Peerless 6	12,000	5,000	151*	Solid.	32.40	Selec.	Dbl chn.	Standard car
Smith C	12,000	4,750	168	Solid.	44.20	Ind-c.	Worm...	Worm drive
Speedwell 8X	12,000	4,400	139	Solid.	40.00	Selec.	Dbl chn.	Motor under floor
Sternberg 12,000		4,650	144	Solid.	36.15	Ind-c.	Dbl chn.	Motor under floor
Walter 6	12,000	4,750	144	Solid.	30.65	Selec.	Int-g-4	4-wheel drive

TRUCKS OF 6½-TON CAPACITY

Moreland 6X	13,000	\$4,500	168	Solid.	44.20	Selec.	Dbl chn.	Distillate fuel
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TRUCKS OF 7-TON CAPACITY AND OVER

Knos-Tractor ... 32	20,000	\$3,750	140	Solid.	40.00	Selec.	Dbl chn.	3-wheeler
Mais Tractor	16,000	2,750	84	Solid.	29.69	Prog.	Int-g....	Int-gear drive
Old Reliable 7	14,000	5,000	126	Solid.	36.15	Selec.	Dbl chn.	Motor under floor
Standard-D 7	14,000	3,300	112	Solid.	32.40	Prog.	Dbl chn.	Standard car
Sternberg 14,000		4,750	144	Solid.	36.15	Ind-c.	Dbl chn.	Motor under floor
Vulcan 7	15,500	6,000	156*	Solid.	36.15	Prog.	Dbl chn.	English design
Walter 7½	15,000	5,000	144	Solid.	38.25	Selec.	Int-g-4	4-wheel drive
Walter Tractor	24,000	4,500	108	Solid.	38.25	Selec.	Int-g-4	4-wheel drive

CAPACITIES NOT GIVEN

Bulley Tractor ...	3,400		72	Solid.	30.65	Selec.	Dbl chn.	3-wheeler
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ABBREVIATIONS: General, * with other options; Opt, optional. Price -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; P&S, pneumatic in front, solid in rear; P&C, pneumatic in front, cushion in rear; C&S, cushion in front, solid in rear. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, electric. Final Drive, Bevel, direct bend; Dbl-red, double-reduction, bevel and spur; Int-g, internal-gear; Worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -f, to front wheels; -4, to all four wheels.

Glossary of Terms Used in 1915 Specifications

Simple Explanation of the Technical Nomenclature Used in Describing Terms Under Which Data Are Listed

ON the succeeding pages there are listed the specifications of 377 American motor truck chassis. For each particular truck, 36 separate items of information are given, except in those cases where manufacturers have failed to give the necessary data after repeated requests.

The completeness of the tables has made necessary the use of many abbreviations in order to describe the

different types of construction, and in each case an explanation of the abbreviations is contained in footnotes beneath the tables.

An explanation of the nomenclature under which the various dimensions and types of construction are listed in the tables is given in the following glossary. This has been arranged in the order in which the terms appear in the tables:

LOAD CAPACITY

The load capacity of a motor truck is the maximum amount of load it is intended to carry in regular service, in addition to the weight of the body, the cab and the crew.

PRICE OF CHASSIS

The chassis price is the list price of the chassis, equipped with a standard seat or cab, and all other standard equipment except the body, which is usually either selected from a stock of standard bodies or built to order, being charged for extra. Some makers, however, do not sell chassis not equipped with bodies, as indicated in the table by a small c following the price, representing that the price is for the complete vehicle.

WHEELBASE

Wheelbase is the length between the centers of the front and rear axles, along the centerline of the truck.

KIND OF TIRES

Tires are made of rubber, steel, and wood. Rubber tires are of four sorts, solid, pneumatic, sectional or block, and cushion. When the latter terms are used, that the tires are made of rubber is understood.

SIZES OF TIRES

Two dimensions are usually given, the diameter and the width. The diameter is the total diameter from tread to tread. Width is often called tread, but in reality it represents the width at the base. Some tires have greater tread width than others of equal base width, because of different cross-sectional contour. Rubber tires are made single and dual, a dual tire being two single ones on one rim. When a tire is specified as of a certain size, dual,

this represents two tires of that size to than others, so that it more nearly approximates the American type. Trucks with this motor location are called Compromise types.

MOTOR LOCATION

There are five common motor locations. The first and most popular is under the hood, forward of the dashboard, at the extreme front of the chassis. There are two styles of hoods, the first and most common form of which consists of a metal cover of substantially uniform height and width extending from the radiator in front to the dash at the rear. Lately, the form of such hoods has been changed on some trucks, so that it slopes upward along the ridgepole or flares outward at the sides. Vehicles with this type of hood are said to be of the European type.

The second type of hood is a one-piece cover somewhat similar to an inverted scoop or scuttle, with a sloping top, flaring sides, also sloping somewhat to the top. In this type, the radiator is mounted back of the motor, on the dash. Trucks with such hoods are called French types, and such hoods are called French hoods or of the Renault type.

The second type of motor location is under the floor of the cab. This has variations, in some of which the motor is located well forward, and in others, further back, the radiator being mounted in front, on the dash, in some cases, and in others in back, behind and below the seat. Trucks with this form of motor location are known as of the American type.

The third type of motor location is that wherein the motor is under a hood with the driver's seat located alongside instead of behind it, or in other words, the motor is located between the seats. This type varies greatly, some trucks having the motor hood further forward than others and some having it lower

proximates the American type. Trucks with this motor location are called Compromise types.

The fourth position of the motor is under the seat, the motor being further to the rear than in the American type, and the floor lower. The radiator is usually carried in front in this construction.

The fifth position is under the body, usually back of the driver's seat, the radiator being in front or under the floor.

On some of the light delivery chassis, the motor is under a hood between a loading space at the front and the dash at the rear, with the radiator at the side.

S. A. E. HORSEPOWER

One horsepower is equal to 33,000 foot-pounds of energy, or sufficient power to lift 33,000 pounds 1 foot in one minute. It is figured theoretically in a four-cycle gasoline engine by the formula first adopted by the A. I. A. M., and now an S. A. E. standard, as follows:

$$D^3 N$$

$$H.P. = \frac{\quad}{2.5}, \text{ in which } D \text{ is the diameter}$$

of the cylinders in inches, or the bore, and N is the number of cylinders.

VALVE LOCATION

Valves of motor truck engines of the four-cycle type are practically all of the poppet type. They may be located in the head, at the side, or on opposite sides. They may also be located in two positions, as the intake at one side and the exhaust overhead. There are three types of cylinder castings, the L-head, the T-head, and the I-head. L-head cylinders have pockets at one side, in which the valves are located, T-head cylinders have these pockets on both sides, and I-

head cylinders have their valves at the top of the cylinder, without pockets. Two-cycle or two-stroke engines, as they are more properly called, have no valves, but instead, they have ports cut in the cylinder wall, which are uncovered by the piston at the lowest portion of its stroke.

WATER CIRCULATION

Two types of water pumps are in general use, the centrifugal type and the gear type. Centrifugal pumps consist of rotors with vanes or paddles on them, inclosed in a casing with an intake connection at the center and an outlet at the periphery. The rotor throws the water from the center to its periphery by centrifugal force. Gear pumps consist of meshing gears in close-fitting casings, with the intake and outlet connections on opposite sides of the point of meshing, the gear teeth acting as paddle-wheels. Thermo-syphon or natural circulation is induced by the rising of the water in the jackets due to heat, whence it overflows into the radiator through an outlet pipe, and runs back to the lower connection to the jackets to be recirculated.

RADIATOR TYPE

Radiators are to be divided into two general classifications, cellular and tubular. The true cellular radiator is built up of sheet metal so as to form intersecting vertical and horizontal water passages and rectangular or hexagonal air passages. Tubular radiators are of three kinds, flat or square-tube, round-tube and zig-zag-tube. Square tube radiators have rectangular tubes arranged to resemble a cellular or honeycomb type, but being in reality individual tubes, either vertical or horizontal. Round tubular radiators have either vertical or horizontal pipes, entirely independent of one another. They are of two types, one of which has the tubes sweated into cross plates, which serve to radiate additional heat, and the other of which has individual fins attached to the tubes separately. The former is called the tubular type and the latter the finned-tube type. Zig-zag tubular radiators consist of square tubes which are crimped to form diamond-shaped air passages to resemble the cellular type of radiator.

IGNITION TYPE

High-tension ignition systems are of the single, dual, double, and dual-double types, in general use. Single systems consist of a single set of plugs, supplied by the magneto only. Dual systems have a battery which may be used

alternatively with the magneto, in starting or running slowly. Double systems have two sets of plugs, one which is supplied by the magneto and the other by a battery. Dual-double systems have two sets of plugs, either of which may be supplied by either the magneto or the battery. In some cases, two batteries are used in dual and double systems instead of the magneto.

GOVERNORS

Governors are of the centrifugal, loose-ball, suction, and hydraulic types. The centrifugal governor consists of revolving weights attached to toggle-levers so that as their speed of rotation increases, and they fly outward against a spring or the retarding influence of gravity, they impart movement to the toggle-levers which, acting upon a throttle in the intake pipe, cause the engine to be shut off at a certain critical speed. The loose-ball type is similar to this except that their weights are balls which are not mechanically connected to the rest of the mechanism, but float between two cones which take the place of the toggle-levers. The suction type is located in the intake manifold and is acted upon by the engine suction rather than by the speed of the engine. The hydraulic type is little more than a pressure gauge which is acted upon by the pressure of the water at high speeds.

GOVERNOR DRIVE

Three types of governor drive are employed, the first, from the motor, causing the governor to control the engine according to its own speed. The second type is driven from the front wheel, the driveshaft, of the gearset layshaft, and controls the motor in accordance with the speed of the truck. The third type is known as duplex drive, consisting of a combination of the above two methods, arranged with over-running clutches so that the fastest of two driving shafts controls the speed of the motor.

SPARK-ADVANCE

Spark-advance is employed to allow for the lag in ignition, or the time it takes the charge to burn, so that at high speeds the spark may occur earlier in the engine cycle, so that by the time ignition has occurred the piston will not have more than just passed top center, permitting it to be retarded in low speeds and in starting to prevent back-kicks which would result from a too-early spark. The usual method is to have a lever on the steering wheel or column, for hand manipulation. Another method is to provide a governor on the magneto

which automatically advances and retards the spark in accordance with the speed of the engine. In other systems, the advance is fixed at top center, or thereabouts, having no adjustment.

LUBRICATION

There are two principal types of motor lubrication, splash and non-splash. Simple, or non-circulating splash consists of the introduction of oil into a splash-pit in the crankcase up to a certain maximum level, from which it is splashed by the connecting rods to the various inner parts of the motor. Circulating-splash is similar, except that an additional reservoir or sump is located below the crankcase, into which the oil overflows, is strained, pumped out again and fed back into the splash pits, sometimes over the timing gears or bearings.

Splash-pressure is similar to circulating-splash, except that the oil is pumped out of the reservoir and onto the engine bearings and possibly through drillways in the crankshaft to the connecting rod and wrist-pin bearings under pressure.

Pressure oiling is the first of the non-splash methods, being similar to the splash-pressure system except that there is no splashing, but every wearing part is oiled either by direct pressure or by a fine mist of oil that is thrown out by the connecting rods as their bearings overflow.

Fuel-injection oiling is used only in two-cycle motors and consists of the admixture of lubricant with the fuel, so that the cylinders are oiled by the gas itself.

CLUTCH TYPE

The most common type of clutch is the cone type. This consists of a relatively flat truncated cone, faced with leather or other friction material, and acting upon a conical face of the fly-wheel or female clutch member. A variation of this type consists of the reversed cone clutch, in which the male cone faces to the rear instead of forward.

Disk clutches are of two types, dry and wet. Dry-disk clutches consist of a series of disks or plates each alternate one of which is attached respectively to a shaft or inner drum or to the casing of the clutch. When tightly compressed, these disks adhere and cause the casing to drive the inner member or vice-versa. Wet-disk or disk-in-oil clutches are similar except that the disks are of metal only, without facing, and run in a bath of oil. Dry-plate and wet-plate clutches are similar to the above except that they have only three friction elements instead of a number. Contracting-band and ex-

panding-shoe clutches are explained by their names.

GEARSET TYPE

Under gearsets, in the table, are grouped all manner of change-speed devices. Gearsets proper are of three types, sliding gear, individual clutch, and the familiar planetary.

Sliding gearsets consist of spur gears of different sizes, carried on parallel shafts, which when slid into mesh in various combinations result in transmission of the drive at various reductions. They are of two kinds, selective and progressive.

The usual selective gearset may be changed from neutral to any speed without passing through any intermediate speeds.

In the progressive type, neutral is located either between first speed and re-

verse or between first and second. In reaching alternate speeds it is necessary to pass through as many intermediate speeds as there may be.

The planetary gearset consists of a series of small gear pinions surrounding a master gear, like the planets surround the sun, the planetary pinions meshing also with an encircling internally-toothed gear, or, at a different reduction, with another solar gear. A clutch may connect the two concentric solar gears for direct drive, while two band brakes, operating in connection with jaw clutches, may hold the frame which holds the planetary gears or the secondary solar gear, so that a reduced forward speed or reverse may be had.

The individual-clutch constant-mesh gearset consists of a lay-out similar to the selective sliding type, except that all of the gears are constantly in mesh,

or connected by silent chains, the different speeds being obtained by manipulation of jaw clutches on the selective plan.

Among other types of change-gears is the friction, which consists of a driving disk, or disks, and a driven wheel, or wheels, friction-tired, and disposed perpendicularly with the disk, upon a shaft, so that it may be slid back and forth across the disk, thus securing different speed ratios, or clear across beyond the center of the disk to secure the reverse position.

The hydraulic change-gear consists of an oil pump and oil motors, so arranged that the stroke of the pump pistons may be varied from 0 to a maximum, thus varying the speeds from nil to maximum with a constant motor speed. The electric drive consists of a generator or dynamo connected with the engine, and

Tabulated Specifications of 377

Conveniently Arranged Tabulation of Chassis, Motor and Equipment Details of
duced by 143 Domestic

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base in Inches	TIRES			Location	MOTOR										
				Kind	SIZES IN INCHES			CYLINDERS			S.A.E. H.P.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear		No.	Bore in Ins.	Stroke in Ins.				Water Circulation	Radiator Type	Type	Make	Spark Advance
A & B 3-T	6,000	4,500	144	Solid....	48x3½d	48x3½d	Under hood..	4	5.17	4.75	42.76	Pairs....	Right...	Gear.....	Finned....	Dual.....	Bosch....	Hand....
A & B 5-T	10,000	4,750	144	Solid....	48x3½d	48x5d	Under hood..	4	5.17	4.75	42.76	Pairs....	Right...	Gear.....	Finned....	Dual.....	Bosch....	Hand....
Adams A	2,000	1,850	121*	Solid....	36x3½	36x4	Under hood..	4	3.75	5.25	22.50	Block....	Left...	Cent.....	Finned....	Sing.....	Eisemann..	Auto.....
Adams D	3,000	2,300	121*	Solid....	36x3½	36x3½d	Under hood..	4	4.12	5.25	27.20	Block....	Left...	Cent.....	Finned....	Sing.....	Eisemann..	Auto.....
Adams E	4,000	2,500	140*	Solid....	36x4	36x4d	Under hood..	4	4.12	5.25	27.20	Block....	Left...	Cent.....	Finned....	Sing.....	Eisemann..	Auto.....
Aetna 1½	3,000	2,150	158	Solid....	36x3½	36x5	Under hood..	4	4.00	4.50	25.60	Pairs....	Opp....	Cent.....	Cell.....	Sing.....	Eisemann..	Auto.....
Aetna 2½	5,000	2,400	158	Solid....	36x4	36x3½d	Under hood..	4	4.37	6.00	34.28	Pairs....	Opp....	Cent.....	Cell.....	Sing.....	Eisemann..	Auto.....
Armleder B	2,000	2,200	136	Pneu....	40x4	39x5	Under hood..	4	4.12	5.25	27.20	Block....	Left...	Cent.....	Sq-t.....	Sing.....	Bosch....	Hand....
Armleder H	3,000	2,150	Opt	Solid....	40x4	40x6*	Under hood..	4	4.50	5.00	32.40	Block....	Opp....	Cent.....	Sq-t.....	Sing.....	Bosch....	Hand....
Armleder E	4,000	2,500	Opt	Solid....	40x4	40x7*	Under hood..	4	4.50	5.00	32.40	Block....	Opp....	Cent.....	Sq-t.....	Sing.....	Bosch....	Hand....
Atterbury AW	1,500	1,800	118	Pneu....	35x4½	35x4½	Under hood..	4	3.50	5.00	19.61	Block....	Right...	Thermo...	Finned....	Sing.....	Bosch....	Fixed....
Atterbury BW	2,000	2,100	137	Solid....	36x3½	36x5	Under hood..	4	3.75	5.25	22.50	Block....	Left...	Cent.....	Finned....	Sing.....	Bosch....	Fixed....
Atterbury CW	4,000	2,800	153	Solid....	36x4	36x4d	Under hood..	4	4.12	5.25	27.20	Block....	Left...	Cent.....	Finned....	Sing.....	Bosch....	Fixed....
Atterbury DW	6,000	3,800	168	Solid....	36x5	40x5d	Under hood..	4	4.50	5.50	32.40	Pairs....	Left...	Cent.....	Finned....	Dual-d...	Bosch....	Hand....
Atterbury E	10,000	4,000	153	Solid....	36x5	42x6d	Under hood..	4	4.87	5.50	38.25	Pairs....	Opp....	Cent.....	Finned....	Dual.....	Bosch....	Fixed....
Auglaize H	1,500	950	100	Solid....	36x2½	36x3	Under seat...	2	5.25	4.00	22.10	Sing....	Head...	Thermo...	Finned....	Dual.....	Remy.....	Hand....
Auglaize D	1,500	950	100	Solid....	36x3½	36x4	Under seat...	4	3.75	5.12	22.50	Block....	Left...	Thermo...	Finned....	Dual.....	Remy.....	Hand....
Autocar 21F	3,000	1,850	97	Opt.....	34x4	34x5	Under seat...	2	3.75	4.50	18.10	Sing....	Right...	Cent.....	Finned....	Sing.....	Bosch....	Fixed....
Available 2,000	2,000	.....	Opt	Solid....	36x3	36x3½	Under hood..	4	3.50	5.00	19.61	Block....	Right...	Thermo...	Finned....	Sing.....	Bosch....	Fixed....
Available 4,000	4,000	.....	Opt	Solid....	36x3½	36x6	Under hood..	4	4.12	5.25	27.20	Block....	Left...	Cent.....	Finned....	Sing.....	Bosch....	Fixed....
Avery C	2,000	1,690	128	Solid....	34x3½	34x5	Under hood..	4	4.12	5.25	27.20	Block....	Left...	Cent.....	Finned....	Dual.....	Heinze...	Hand....
Avery B	4,000	2,700	128	Solid....	36x4	36x3½d	Under floor...	4	4.75	5.00	36.15	Sing....	Left...	Cent.....	Finned....	Dual.....	Eisemann..	Auto.....
Avery B	6,000	3,200	128	Solid....	38x5	38x4d	Under floor...	4	4.75	5.00	36.15	Sing....	Left...	Cent.....	Cell.....	Dual.....	Eisemann..	Auto.....
Avery A	6,000	2,500e	140	Wood....	38x5	38x4d	Betw. seats...	4	4.75	5.00	36.15	Sing....	Left...	Cent.....	Finned....	Dual.....	Eisemann..	Auto.....
Avery B	10,000	4,500	128	Solid....	38x6	38x5d	Under floor...	4	5.25	5.75	44.20	Pairs....	Opp....	Cent.....	Cell.....	Dual.....	Eisemann..	Auto.....
B. A. Gramm 1	2,000	1,750	130	Solid....	34x3½	36x4	Under hood..	4	3.75	5.25	22.50	Block....	Left...	Cent.....	Cell.....	Sing.....	Bosch....	Hand....
B. A. Gramm 2	4,000	2,550	146	Solid....	36x4	36x3½d	Under hood..	4	4.25	5.75	29.00	Pairs....	Left...	Cent.....	Cell.....	Dual.....	Bosch....	Hand....
B. A. Gramm 3½	7,000	3,400	158	Solid....	36x5	40x5d	Under hood..	4	4.25	5.75	29.00	Pairs....	Left...	Cent.....	Cell.....	Dual.....	Bosch....	Hand....
B. A. Gramm 5	10,000	4,300	168	Solid....	36x6	40x6d	Under hood..	6	4.12	5.50	40.80	Threes...	Right...	Cent.....	Cell.....	Dual.....	Bosch....	Hand....
Barker U	2,000	2,000	130	Solid....	42x3½	42x5	Under hood..	4	4.00	5.00	25.60	Block....	Left...	Thermo...	Cell.....	Sing.....	Eisemann..	Auto.....
Barker V	4,000	2,400	136	Solid....	36x4	36x7	Under hood..	4	4.00	5.00	25.60	Block....	Left...	Thermo...	Cell.....	Sing.....	Eisemann..	Auto.....

ABBREVIATIONS: General, * with other options; Opt, optional. Price, -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; Pds, pneumatic in front, solid in rear; Pds, pneumatic in front, cushion in rear; Cds, cushion in front, solid in rear. Tire Sizes, d, dual. Motor Location, Betw seats, between seats. Cylinders Cast, Sing, singly or individually. Location of Valves, Opp, opposite, or T-head type; Top (2-cylinder motors only), L-head cylinder laid horizontal with valves up; R&h, at right and in head, L-head cylinder; L&h, at left and in head, L-head cylinder; 2-cyc, two-cycle motor, no valves; Back, L-head motor placed transversely with valves at rear. Water Circulation, Cent, centrifugal pump; Gear, gear pump; Thermo, Thermo-siphon circulation; Air, air-cooled, no water. Radiator Type, Finned, finned-tube; Cell, cellular or honey-comb; Sq-t, square-tube or flat-tube; Z-s-t, zig-zag-tube or crimped flat-tube. Ignition, Type, Sing, single; Doub, double; Dual-d, dual-double. Make of Magneto (or other sparking device), Split, Spildorf; Conn, Connecticut; King, Kingston; West, Westinghouse; Day-D, Dayton-Dick; Atw-K, Atwater-Kent. Spark Advance, Auto, automatic; 2-Pt, two-point fixed, battery circuit fixed in rear, magneto in advance. Governor Type, Cent, centrifugal; L-b, loose-ball; Suct, suction; Hyd, hydraulic. Governor Drive, Motor, from motor; D-shft, from driving shaft; F-wheel, from front wheel; Gearset, from gearset countershaft; Duplex, from both the motor and the driving shaft, by overrunning clutches.

electric motors to drive the wheels. The electric motors generate their power at all speeds, thus taking the place of the gearset.

TOTAL GEAR-RATIO

Total gear-ratio is the total reduction from the engine crankshaft to the road wheels. For example, if in high gear, the engine of a truck must revolve 9 times to one revolution of the road wheels, the gear-ratio is 9 to 1.

FINAL DRIVE

Final drive means are greatly diversified. Single-chain drive consists of a single chain from a live axle to the change-gear. Double-chain drive consists of two chains driving the wheels individually from a jackshaft, laid across the frame, parallel with the dead rear axle, the jackshaft being driven by bevel

gears, usually, from a driving shaft leading to the gearset.

Bevel, or direct bevel drive, consists of a live axle which is driven by bevel gears direct from the driving shaft. Double-reduction drive consists of a similar drive to direct bevel except that a set of spur gears is introduced between the bevel gears and the differential. Internal-gear drive consists of a live jackshaft incorporated with a dead axle, and driving the wheels by spur pinions meshing with internal teeth on the brake-drums.

Worm-drive is similar to direct bevel drive except that worm gears are substituted for bevel gears, the worm being over or under the wheel.

DRIVING TORQUE

Driving torque is the tendency of a live axle to twist under driving stress.

It is taken by means of the springs, which for this purpose are anchored to the axle with extra rigidity and shackled to the frame at one point only; by a torque-arm attached to the axle and, at one point, to the frame; by converging radius rods, attached at opposite ends of the axle to the frame at one point; by a torsion tube, surrounding the driving shaft; or by the extended engine sub-frame, which is attached to the center of the axle and at two points to the frame.

PROPULSION

Propulsion, or the pushing or pulling effort of the driving axle, is transmitted to the frame by radius rods, or distance rods, consisting of steel bars jointed to the axle and to the frame; by the torsion tube, or by the vehicle spring, in which case they are shackled only at one end.

1915 American Motor Truck Chassis

Gasoline and Gasoline-Electric Motor Trucks Delivery Wagons and Tractors Manufacturers, for Comparison

MOTOR				TRANSMISSION								SPRINGS		CONTROL		Propulsion Taken By	Name and Model		
GOVERNOR		SPEEDS		Carbur-eter Make	Lubrica-tion	Clutch Type	GEARSET			Total Gear-Ratio in High	Final Drive	Torque Taken By	Front	Rear	Steer			Levers	
Type	Drive	Motor in R.p.m.	Truck in M.p.h.				Type	Location	Speeds										
				Scheb.	Circ-spl.		Elec.	Amid	2	28 -1	Int-gear-f.	R-r	3-Ell	3-Ell	Right	Right	R-r	A & B	3-T
				Scheb.	Circ-spl.		Elec.	Amid	2	28 -1	Int-gear-f.	R-r	3-Ell	3-Ell	Right	Right	R-r	A & B	5-T
Cent	Motor	1,300	15	Zenith	Circ-spl.	Dry-d	Selec.	Unit-j	3	7½-1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	Adams	A
Cent	Motor	1,200	13	Zenith	Circ-spl.	Dry-d	Selec.	Unit-j	3	7½-1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	Adams	D
Cent	Motor	1,100	12	Zenith	Circ-spl.	Dry-d	Selec.	Unit-j	3	7½-1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	Adams	E
Cent	D-shft	1,000	15	Scheb.	Spl-press	Dry-d	Selec.	Unit-m	3	8 -1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Aetna	1½
Cent	Motor	1,000	14	Scheb.	Spl-press	Dry-d	Selec.	Unit-m	3	7 -1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Aetna	2½
		1,300	20	Scheb.	Circ-spl.	Dry-d	Selec.	Unit-m	3	5½-1	Bevel	T-arm	3-Ell	Ellip	Left	Cent	R-r	Armleder	B
		1,300	16	Scheb.	Splash	Wet-d	Selec.	Unit-j	3	8 -1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	Armleder	H
		1,300	16	Scheb.	Splash	Wet-d	Selec.	Unit-j	3	8½-1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	Armleder	E
		1,200	22½	Strom	Circ-spl.	Dry-d	Selec.	Unit-m	3	6 -1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Atterbury	AW
Cent	Motor	1,200	18½	Strom	Circ-spl.	Dry-d	Selec.	Unit-m	3	6½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Atterbury	BW
Cent	Motor	1,200	14	Strom	Circ-spl.	Dry-d	Selec.	Unit-m	3	9½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Atterbury	CW
Cent	Motor	1,200	12	Strom	Circ-spl.	Dry-d	Selec.	Unit-m	3	10½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	R-r	Atterbury	DW
Cent	Motor	1,200	10	Strom	Circ-spl.	Wet-d	Selec.	Unit-j	3	12 -1	Dbl chn		3-Ell	3-Ell	Right	Right	R-r	Atterbury	E
L-b	D-shft	1,200	12	Scheb.	Circ-spl.	Wet-d	Selec.	Unit-j	2	8 -1	Bevel	R-r	3-Ell	3-Ell	Right	Right	R-r	Auglaize	H
L-b	D-shft	1,000	18	Scheb.	Circ-spl.	Wet-d	Selec.	Unit-j	3	7 -1	Bevel	R-r	3-Ell	3-Ell	Right	Right	R-r	Auglaize	D
None	None		20	Strom	Spl-press	Dry-p	Prog	Amid	3	7 -1	Dbl-red	Springs	3-Ell	Plat	Right	Right	Springs	Autocar	21F
Cent	Motor	1,000	16	Ray	Circ-spl.	Dry-d	Selec.	Unit-m	3	6½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Available	
Cent	Motor	1,000	14	Ray	Circ-spl.	Dry-d	Selec.	Unit-m	3	7½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Available	
Cent	Motor	1,200	15	Ray	Spl-press	Dry-d	Selec.	Unit-m	3	7½-1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	Avery	C
L-b	Motor	1,200	14½	Ray	Spl-press	Dry-d	Selec.	Unit-j	3	3½-1	Dbl chn		3-Ell	3-Ell	Right	Cent	R-r	Avery	B
Cent	Motor	1,200	13	Ray	Spl-press	Dry-p	Selec.	Unit-j	3	3½-1	Dbl chn		3-Ell	3-Ell	Right	Cent	R-r	Avery	A
Cent	Motor	1,200	12	Ray	Spl-press	Dry-d	Selec.	Unit-j	3	3½-1	Dbl chn		3-Ell	3-Ell	Right	Cent	R-r	Avery	A
Cent	Motor	1,000	10	Scheb.	Spl-press	Wet-d	Selec.	Unit-j	3	12½-1	Dbl chn		3-Ell	3-Ell	Right	Cent	R-r	Avery	B
Cent	Motor	1,000	16	Scheb.	Spl-press	Cone	Selec.	Unit-j	3	7 -1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	B. A. Gramm	1
Cent	Motor	1,000	15	Strom	Spl-press	Dry-d	Ind-c	Amid	3	8½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	B. A. Gramm	2
Cent	Motor	1,100	12	Strom	Spl-press	Dry-d	Ind-c	Amid	4	9½-1	Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	B. A. Gramm	3
Cent	Motor	1,000	10	Strom	Spl-press	Dry-d	Ind-c	Amid	4	11 -1	Dbl chn		3-Ell	3-Ell	Left	Cent	R-r	B. A. Gramm	5
None	None	1,500	27	Strom	Spl-press	Dry-p	Selec.	Unit-m	4		Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Barker	U
None	None	1,500	20	Strom	Spl-press	Dry-p	Selec.	Unit-m	4		Top worm	Springs	3-Ell	3-Ell	Left	Cent	Springs	Barker	V

Carburetor Make, Strom, Stromberg; Scheb, Schebler; Ray, Rayfield; Exel, Excelior; King, Kingston; B-Z, Breeze-Zephyr. Lubrication, Splash, non-circulating or simple splash; Cire-spl, circulating splash; Spl-press, splash-pressure; Fuel-inj, fuel injection, oil mixed with fuel; Pressure, pressure feed, no splash. Clutch Type, Dry-p, dry plate; Dry-d, dry multiple disk; Wet-d, wet disk or disk-in-oil; R-cone, reversed cone or inverted cone; Exp-s, expanding shoe; Cont-b, contracting band. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, electric. Gearset Location, Amid, amidships; Unit-m, unit with motor; Unit-j, unit with jackshaft; Unit-x, unit with axle; Unit-a, unit driveshaft. Final Drive, Bevel, direct bevel; Doub-r, double-reduction bevel and spur; Int-x, internal gear; Top worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -f, to front wheels; -4, to all four wheels. Driving Torque, R-r, radius rods; T-arm, torque-arm; Tor-t, torsion tube; Sub-f, sub-frame. Springs, Ellip, elliptic; 3-Ell, half-elliptic; 4-Ell, quarter-elliptic; 3-Ell, three-quarters-elliptic; Plat, platform; T-ell, transverse elliptic; Cant, cantilever; Comb, combination of half-elliptic and elliptic on double frames. Steering, Cent, center. Levers, Cent, center; C&T, gearshift center, brake right; C&L, gearshift center brake left; St-col, steering column. Propulsion R-r, radius rods; T-arm, torque arm; Tor-t, torsion tube; Sub-f, sub-frame.

Products of 377 Gasoline Truck Makers

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base in Inches	TIRES			MOTOR											
				Kind	SIZES IN INCHES		Location	CYLINDERS			S.A.E. H.P.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear		No.	Bore in Ins.	Stroke in Ins.				Water Circulation	Radiator Type	Type	Make	Spark Advance
Bauer.....A	1,000	900	100	Solid....	36x2	36x2	Under hood..	4	3.75	5.00	22.50	Block	Right	Cent....	Finned	Sing....	Mea....	Hand....
Bauer.....B	1,500	1,150	110	Solid....	34x3	34x3½	Under hood..	4	3.75	5.00	22.50	Block	Right	Cent....	Finned	Sing....	Mea....	Hand....
Beck.....	3,000	1,600	130	Solid....	34x3½	38x4	Under hood..	4	4.12	5.25	27.20	Pairs..	R&H	Gear....	Sq-t....	Dual....	Bosch..	Hand....
Beck.....	5,000	1,850	130	Solid....	36x5	36x6	Under hood..	4	5.00	6.00	40.00	Pairs..	Opp....	Gear....	Sq-t....	Dual....	Bosch..	Hand....
Bessemer.....C	2,000	1,250	108	Solid....	34x3½	34x4	Under hood..	4	3.50	5.00	19.61	Block	Right	Thermo.	Finned	Sing....	Eisemann.	Hand....
Bessemer.....A	3,000	1,800	136	Solid....	34x4	34x5	Under hood..	4	4.12	5.25	27.20	Block	Left..	Thermo.	Finned	Sing....	Eisemann.	Hand....
Bessemer.....D	4,000	2,300	136	Solid....	36x4	36x3½d	Under hood..	4	4.12	5.25	27.20	Block	Left..	Thermo.	Finned	Sing....	Eisemann.	Hand....
Best.....A	1,200	750	78	Solid*..	32x2*	34x2½*	Under floor..	2	4.50	4.50	16.20	Sing....	Opp....	Thermo.	Finned	Dual....	Remy....	Auto....
Blair.....C-1	4,000	2,850	114*	Solid....	34x4	34x3½d	Betw. seats..	4	4.12	5.25	27.20	Block	Left..	Cent....	Sq-t....	Sing....	Bosch..	Fixed..
Blair.....D-1	6,000	3,250	120*	Solid....	36x4	36x4d	Betw. seats..	4	4.75	5.50	36.15	Pairs..	Right	Cent....	Sq-t....	Dual....	Bosch..	Fixed..
Blair.....E-1	8,000	3,750	135*	Solid....	36x5	36x5d	Betw. seats..	4	4.75	5.50	36.15	Pairs..	Right	Cent....	Sq-t....	Dual....	Bosch..	Fixed..
Blair.....F	10,000	4,500	135*	Solid....	36x6	36x6d	Betw. seats..	4	4.75	5.50	36.15	Pairs..	Right	Cent....	Sq-t....	Dual....	Bosch..	Fixed..
Brasie.....Packet	600	375	100	Pneu....	28x3	28x3	Under hood..	4	2.50	4.00	10.00	Block	Right	Thermo.	Cell....	Sing....	Berling.	Hand....
Brasie.....Twin City	4,000	1,350	104	Solid....	34x3	36x3½	Under seat...	2	5.00	5.00	20.00	Sing....	Top....	Thermo.	Cell....	Sing....	K.W....	Hand....
Brasie.....Twin City	4,000	1,350	104	Solid....	34x3	36x3½	Under floor..	4	3.75	4.50	22.50	Pairs..	Right	Thermo.	Cell....	Sing....	K.W....	Hand....
Brockway.....G	1,500	1,205	100	Solid....	36x2½	36x3	Under hood..	4	3.50	5.00	19.61	Block	Left..	Thermo.	Finned	Sing....	Bosch..	Fixed..
Brockway.....H	2,500	1,590	112*	Solid....	36x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	Left..	Cent....	Finned	Sing....	Bosch..	Fixed..
Brockway.....I	4,000	1,875	120*	Solid....	36x4	36x3½d	Under hood..	4	4.12	5.25	27.20	Block	Left..	Cent....	Finned	Sing....	Bosch..	Fixed..
Buick.....C-4	1,500	1,150	122	Pneu....	35x5	35x5	Under hood..	4	3.75	5.00	22.50	Pairs..	Head..	Cent....	Finned	Dual....	Delco..	Hand....
Bulley.....Tractor	3,400	72	72	Solid....	34x4	38x4d	Under hood..	4	4.37	5.50	30.65	Pairs..	Right	Cent....	Finned	Dual....	Remy....	Hand....
Chase.....S	1,000	750	98	Solid....	36x2	36x2	Under hood..	3	4.12	4.00	2-cyl..	Sing....	2-cyl.	Air....	Sing....	Bosch..	Fixed..	
Chase.....T	1,500	1,500	135	Solid....	36x2½	36x3½	Under hood..	4	3.50	5.00	19.61	Block	Right	Cent....	Finned	Sing....	Bosch..	Fixed..
Chase.....R	3,000	2,200	146*	Solid....	36x3½	36x5	Under hood..	4	3.75	5.25	22.50	Block	Left..	Cent....	Finned	Sing....	Bosch..	Fixed..
Chase.....O	6,000	3,300	175	Solid....	36x5	36x5d	Under hood..	4	4.50	5.50	32.40	Pairs..	Left..	Cent....	Finned	Sing....	Bosch..	Fixed..
Coleman.....D	2,000	1,950	112	Solid....	36x3½	36x4	Under seat...	4	3.75	5.25	22.50	Block	Left..	Cent....	Z-s-t..	Sing....	Bosch..	Hand....
Coleman.....G	4,000	2,450	124	Solid....	36x4	36x3½d	Under seat...	4	3.75	5.25	22.50	Block	Left..	Cent....	Z-s-t..	Sing....	Bosch..	Hand....
Coleman.....H	6,000	3,000	134	Solid....	36x5	36x5d	Under seat...	4	4.12	5.50	27.20	Pairs..	Right	Cent....	Z-s-t..	Sing....	Bosch..	Hand....
Commerce.....S	1,500	875	107	Pneu....	33x4	33x4	Under hood..	4	3.50	5.00	19.61	Block	R&H..	Thermo.	Finned	Sing....	Eisemann.	Fixed..
Continental.....F	3,000	1,700	144	Solid....	36x3½	36x4	Under hood..	4	3.25	4.25	16.92	Block	Left..	Cent....	Cell....	Dual....	Bosch..	Hand....
Continental.....G	6,000	2,700	144	Solid....	36x3½	36x4	Under hood..	4	3.25	4.25	16.92	Block	Left..	Cent....	Cell....	Dual....	Bosch..	Hand....
Corbitt.....F	2,500	2,000	130	Solid....	36x3½	40x4	Under hood..	4	3.75	5.25	22.50	Block	Left..	Cent....	Cell....	Sing....	Bosch..	Hand....
Couple-Gear.....HC	7,000	4,850	144	Solid....	36x4d	36x4d	Under floor..	4	5.25	6.00	44.20	Sing....	Opp....	Cent....	Sq-t....	Dual....	Mea....	2-pt..
Couple-Gear.....AC	10,000	5,400	144	Solid....	36x5d	36x5d	Under floor..	4	5.75	6.00	53.00	Sing....	Opp....	Cent....	Sq-t....	Dual....	Mea....	2-pt..
Crawford.....	6,000	3,000	144	Solid....	37x4	37x4d	Under hood..	4	4.50	5.50	32.40	Pairs..	Left..	Cent....	Cell....	Dual....	Bosch..	Hand....
Crown.....A	1,500	2,000	120	Pneu....	34x4	34x4½	Under hood..	4	3.75	5.00	22.50	Block	Right	Cent....	Finned	Sing....	Bosch..	Fixed..
Crown.....B	3,000	2,500	140	Solid....	34x3½	36x5	Under hood..	4	4.00	5.00	25.60	Block	Right	Cent....	Finned	Sing....	Bosch..	Fixed..
Crown.....C	5,000	3,000	150	Solid....	34x4	36x6	Under hood..	4	4.25	5.00	29.00	Pairs..	Opp....	Cent....	Finned	Sing....	Bosch..	Hand....
Curtis.....	4,000	2,750	130	Solid....	36x4	36x3½d	Under floor..	4	4.12	5.25	27.20	Block	Right	Thermo.	Finned	Sing....	Eisemann.	Auto....
Curtis.....	6,000	3,250	130	Solid....	36x4	36x4d	Under floor..	4	4.12	5.25	27.20	Block	Right	Thermo.	Finned	Sing....	Eisemann.	Auto....
Daimler, Amer. FV	12,000	169½	169½	Solid....	34x5	40x6d	Under hood..	4	4.25	5.90	29.00	Pairs..	Head..	Cent....	Cell....	Sing....	Bosch..	Fixed..
Dart.....A	1,000	845	100	Pneu....	32x3½	32x3½	Under hood..	4	3.62	4.00	34.28	Block	Head..	Thermo.	Cell....	Dual....	Briggs..	Hand....
Dart.....B	2,000	1,400	114	Solid....	37x3	37x3½	Under hood..	4	3.50	5.00	19.61	Block	Right	Thermo.	Cell....	Sing....	Eisemann.	Fixed..
Dart.....C	4,000	1,800	130*	Solid....	35x4	39x4	Under hood..	4	4.12	5.50	27.20	Block	Right	Cent....	Cell....	Sing....	Eisemann.	Fixed..
Dayton.....U	2,000	1,800	118½	Solid....	36x4	36x3d	Under floor..	4	4.25	5.00	29.00	Pairs..	Opp....	Gear....	Finned	Dual....	Bosch..	Hand....
Dayton.....A	8,000	2,700	136	Solid....	36x5	36x4d	Under floor..	4	4.75	5.50	36.15	Pairs..	Opp....	Gear....	Finned	Dual....	Bosch..	Hand....
Decatur.....VI	800	630	102	Pneu....	30x3½	30x3½	Under body..	4	2.75	4.00	12.08	Block	Right	Gear....	Finned	Sing....	Berling.	Fixed..
Decatur.....C	2,000	1,500	113*	Solid*..	34x3½*	34x4*	Under hood..	4	3.75	5.25	22.50	Block	Left..	Cent....	Cell....	Sing....	Bosch..	Fixed..
DeKalb.....D1	3,000	1,950	134	Solid....	34x3½	36x5	Under hood..	4	4.12	5.25	27.20	Block	Left..	Cent....	Finned	Sing....	Eisemann.	Hand....
DeKalb.....D2	5,000	2,450	136	Solid....	36x4	38x6	Under hood..	4	4.12	5.25	27.50	Block	Left..	Cent....	Finned	Sing....	Eisemann.	Fixed..
Denby.....A	1,500	1,500	120	Solid....	34x3	34x4	Under hood..	4	3.50	5.00	19.61	Block	Right	Thermo.	Finned	Sing....	Eisemann.	Fixed..
Denby.....B	2,000	1,600	120	Solid....	34x3½	34x5	Under hood..	4	3.50	5.00	19.61	Block	Right	Thermo.	Finned	Sing....	Eisemann.	Fixed..
Dorris.....IA4	1,500	1,950	132*	Pneu....	36x4½	36x4½	Under hood..	4	4.37	5.00	30.65	Pairs..	Head..	Cent....	Cell....	Dual....	Bosch..	Hand....
Dorris.....IA4	4,000	2,500	144*	Solid....	36x3½	36x3½d	Under hood..	4	4.37	5.00	30.65	Pairs..	Head..	Cent....	Finned	Dual....	Bosch..	Hand....
Duplex.....C	4,000	2,800	130	Solid....	35x4	35x4	Under hood..	4	4.12	5.50	27.20	Block	Right	Cent....	Finned	Sing....	Eisemann.	Auto....
Duplex.....D	6,000	3,200	130	Solid....	35x5	35x5	Under hood..	4	4.25	5.50	29.00	Block	Right	Cent....	Finned	Sing....	Eisemann.	Auto....
Fargo.....E	1,500	750	100	Solid....	34x2½	34x3	Under body..	2	4.50	6.00	16.20	Sing....	Head..	Thermo.	Z-s-t..	Dual....	Briggs..	Hand....
Fargo.....F	2,000	1,250	130	Solid....	36x3	36x3½	Under hood..	4	3.75	5.00	22.50	Block	Right	Thermo.	Finned	Dual....	Bosch..	Hand....
Federal.....GH	3,000	1,800	120*	Solid....	36x3½	36x5	Under hood..	4	4.12	5.25	27.20	Block	Left..	Cent....	Cell....	Sing....	Eisemann.	Fixed..
Federal.....GW-HW	3,000	1,900	120*	Solid....	36x3½	36x5	Under hood..	4	4.12	5.25	27.20	Block	Left..	Cent....	Cell....	Sing....	Eisemann.	Fixed..
Flint.....C	2,000	1,285*	106	Solid*..	34x3*	35x3½*	Under hood..	4	3.75	4.50	22.50	Block	R&H..	Thermo.	Finned	Dual....	Remy....	Hand....
Forschler.....IA	3,000	2,300	124*	Solid....	36x3½	36x3d	Under hood..	4	4.12	5.25	27.20	Block	Left..	Cent....	Sq-t....	Dual....	Bosch..	Hand....
Four Wheel Drive-G	4,000	3,400	124	Solid....	36x4	36x4	Under seat...	4	4.25	5.00	29.00	Pairs..	Opp....	Cent....	Sq-t....	Sing....	Bosch..	Hand....
Four Wheel Drive-B	6,000	4,000	124	Solid....	36x6	36x6	Under seat...	4	4.75	5.50	36.15	Pairs..	Opp....	Cent....	Sq-t....	Sing....	Bosch..	Hand....
Four Wheel Drive-M	12,000	4,800	148	Solid....	38x5d	38x5d	Under seat...	4	5.25	7.00	44.20	Pairs..	Opp....	Cent....	Sq-t....	Dual....	Bosch..	Hand....
Fremont-Mais.....O	4,000	1,700*	132*	Solid....	36x3½	36x5	Under hood..	4	3.75	5.50	22.50	Block	Right	Cent....	Finned	Sing....	Eisemann.	Fixed..

ABBREVIATIONS: General, * with other options; Opt, optional. Price, -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; Pda, pneumatic in front, solid in rear; Pda, pneumatic in front, cushion in rear; Cds, cushion in front, solid in rear. Tire Sizes, d, dual. Motor Location, Betw seats, between seats. Cylinder Cast, Sing, singly or individually. Location of Valves, Opp, opposite, or T-head type; Top (2-cylinder motors only) L-head cylinder laid horizontal with valves up; R&H, at right and in head, L-head cylinder; L&H, at left and in head, L-head cylinder; 2-cyl, two-cylinder motor, no valves; Back, L-head motor placed transversely with valves at rear. Water Circulation, Cent, centrifugal pump; Gear, gear pump; Thermo, thermo-siphon circulation; Air, air-cooled, no water. Radiator Type, Finned, finned-tube; Cell, cellular or honeycomb; Sq-t, square-tube or flat-tube; Z-s-t, zig-zag-tube or crimped flat-tube. Ignition, Type, Sing, single; Doub, double; Dual-d, dual-double. Make of Magneto (or other sparking device), Split, Splitdorf; Conn, Connecticut; King, Kingston; West, Westinghouse; Day-D, Dayton-Dick; Atw-K, Atwater-Kent. Spark Advance, Auto, automatic; 2-pt, two-point fixed, battery circuit fixed in retard, magneto in advance. Governor Type, Cent, centrifugal; L-b, loose-ball; Suct, suction; Hyd, hydraulic. Governor Drive, Motor, from motor; D-shft, from driving shaft; F-wheel, from front wheel; Gearset, from gearset countershaft; Duplex, from both the motor and the driving shaft, by overrunning clutches.

in Tabulated Form for Quick Comparison

MOTOR				TRANSMISSION							SPRINGS		CONTROL		Propulsion Taken By	Name and Model			
GOVERNOR		SPEEDS		Carbur- eter Make	Lubrica- tion	Clutch Type	GEARSET			Total Gear- Ratio in High	Final Drive	Torque Taken By	Front	Rear			Steer	Levers	
Type	Drive	Motor in R.p.m.	Truck in M.p.h.				Type	Location	Speeds										
None	None	1,500	25	Scheb	Spl-press	Wet-d	Selec	Unit-m	3	6-1	Dbl-red	T-arm	1-El	Ellip	Left	Cent	R-r	Bauer	A
None	None	1,500	23	Scheb	Spl-press	Wet-d	Selec	Unit-m	3	6-1	Dbl-red	T-arm	1-El	Ellip	Left	Cent	R-r	Bauer	B
Hyd	Motor		16	Strom	Splash	Wet-d	Selec	Unit-m	3		Int-gear	Springs	1-El	1-El	Left	Cent		Beck	
Hyd	Motor		12	Strom	Splash	Wet-d	Selec	Unit-m	3		Int-gear	Springs	1-El	1-El	Left	Cent		Beck	
None	None			Ray	Spl-press	Cone	Selec	Unit-j	3	6-1	Dbl chn		1-El	1-El	Left	Cent	R-r	Bessem	A
None	None			Ray	Spl-press	Cone	Selec	Unit-j	3	7-1	Dbl chn		1-El	Plat	Left	Cent	R-r	Bessem	A
Cent	Motor	1,000	14	Ray	Spl-press	Cone	Selec	Amid	3	7-1	Top worm	Springs	1-El	1-El	Left	Cent	Springs	Bessem	D
Cent	Motor	800	18	Marvel	Splash	None	Fric	Unit-j	Any	6-1	Dbl chn		1-El	Ellip	Left	St-col	R-r	Best	A
Cent	Motor	1,100	15	S.U.	Spl-press	Cone	Ind-c	Amid	3	7-1	Top worm	Sub-f	1-El	1-El	Right	Right	R-r	Blair	C-1
Cent	Motor	1,000	14	S.U.	Spl-press	Cone	Ind-c	Amid	3	8-1	Top worm	Sub-f	1-El	1-El	Right	Right	R-r	Blair	D-1
Cent	Motor	1,000	13	S.U.	Spl-press	Cone	Ind-c	Amid	3	9-1	Top worm	Sub-f	1-El	1-El	Right	Right	R-r	Blair	E-1
Cent	Motor	1,200	12	S.U.	Spl-press	Cone	Ind-c	Amid	3	12-1	Top worm	Sub-f	1-El	1-El	Right	Right	R-r	Blair	F
				Mayer	Circ-spl	None	Fric	Unit-j	Any		Dbl chn		1-El	1-El	Left	Left	R-r	Brasie	Packet
				Scheb	Spl-press	Wet-d	Plan	Unit-j	2		Dbl chn		1-El	1-El	Right	Right	R-r	Brasie	Twin City
				Scheb	Spl-press	Wet-d	Selec	Unit-j	3		Dbl chn		1-El	1-El	Right	Right	R-r	Brasie	Twin City
Cent	Motor	1,500	18	Scheb	Circ-spl	Cone	Selec	Unit-j	3	7-1	Dbl chn		Ellip	Ellip	Left	Cent	R-r	Brockway	G
Cent	Motor	1,200	15	Scheb	Circ-spl	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-El	Plat	Left	Cent	R-r	Brockway	H
Cent	Motor	1,200	15	Scheb	Circ-spl	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-El	Plat	Left	Cent	R-r	Brockway	I
Cent	Motor	1,800	25	Marvel	Circ-spl	Cone	Selec	Unit-x	3	6-1	Bevel	T-arm	1-El	Ellip	Left	Cent	T-arm	Buick	C-4
Cent	Motor	800	12	Strom	Circ-spl	Dry-p	Selec	Unit-j	3	14-1	Dbl chn		1-El	1-El	Right	Right	R-r	Bulley	Tractor
None	None	750	15	Holley	Fuel-inj	Wet-d	Plan	Amid	2	7-1	Dbl chn		Ellip	1-El	Left	Cent	R-r	Chase	S
Cent	Motor	1,200	22	Holley	Spl-press	Dry-p	Selec	Unit-m	3	6-1	Top worm	Springs	1-El	1-El	Left	Cent	Springs	Chase	T
Cent	Motor	1,200	18	Holley	Spl-press	Dry-p	Selec	Unit-m	3	7-1	Top worm	Springs	1-El	1-El	Right	Cent	Springs	Chase	R
Cent	Motor	1,200	18	Holley	Spl-press	Dry-p	Selec	Unit-m	4	5-1	Top worm	Springs	1-El	1-El	Right	Cent	Springs	Chase	O
Suct	Motor	1,000	16	Scheb	Spl-press	Cone	Selec	Unit-j	3	6-1	Dbl chn		Ellip	Ellip	Right	Right	R-r	Coleman	D
Suct	Motor	1,000	14	Scheb	Spl-press	Cone	Selec	Unit-j	3	9-1	Dbl chn		Ellip	Plat	Right	Right	R-r	Coleman	G
Suct	Motor	1,000	12	Scheb	Spl-press	Cone	Selec	Unit-j	3	9-1	Dbl chn		Ellip	Plat	Right	Right	R-r	Coleman	H
		2,000	25	Holley	Circ-spl	Cone	Selec	Unit-m	3	6-1	Bevel	Tor-t	1-El	1-El	Left*	Cent	Springs	Commerce	S
Cent	Motor	1,200		Strom	Circ-spl	Cone	Selec		3		Opt		1-El	1-El	Right	Right	R-r	Continental	F
Cent	Motor	1,200		Strom	Circ-spl	Cone	Selec		3		Opt		1-El	1-El	Right	Right	R-r	Continental	G
Cent	Motor	1,100	16	Strom	Circ-spl	Wet-d	Selec	Unit-j	3	6-1	Dbl chn		1-El	1-El	Left	Cent	R-r	Corbitt	F
Cent	Motor	1,200	15	Strom	Circ-spl	None	Elec	Unit-m	5	25-1	Bevel-4	Springs	1-El	1-El	Right	Cent	R-r	Couple-Gear	HC
Cent	Motor	1,000	12	Strom	Circ-spl	None	Elec	Unit-m	5	25-1	Bevel-4	Springs	1-El	1-El	Right	Cent	R-r	Couple-Gear	AC
Suct	Motor	2,000	15	Strom	Circ-spl	Cone	Selec	Amid	3		Dbl chn		1-El	1-El	Right		R-r	Crawford	
Cent	Motor	1,050	20	Strom	Splash	Cone	Selec	Amid	4		Top worm	Springs	1-El	1-El	Left	Cent	Springs	Crown	A
Cent	Motor	1,050	15	Strom	Circ-spl	Cone	Selec	Amid	4		Top worm	Springs	1-El	1-El	Left	Cent	Springs	Crown	B
Cent	Motor	1,050	12	Strom	Circ-spl	Cone	Selec	Amid	4		Top worm	Springs	1-El	1-El	Left	Cent	Springs	Crown	C
Cent	Motor	1,500		Excel	Spl-press	Cone	Selec	Amid	3		Dbl chn		1-El	1-El	Right	Right	R-r	Curtis	
Cent	Motor	1,500		Excel	Spl-press	Cone	Selec	Amid	3		Dbl chn		1-El	1-El	Right	Right	R-r	Curtis	
Cent	Motor	850	10	Daimler	Spl-press	R-cone	Selec	Amid	4	9-1	Int-gear	T-arm	1-El	1-El	Right	Right	R-r	Daimler, Amer.	FV
None	None	1,400	23	Strom	Splash	Cone	Selec	Unit-x	3	6-1	Bevel	Tor-t	1-El	1-El	Left	Cent	Tor-t	Dart	A
None	None	1,200	20	Strom	Splash	Dry-d	Selec	Unit-m	3	Opt	Dbl chn		1-El	1-El	Left	Cent	R-r	Dart	B
None	None	1,100	15	Strom	Splash	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-El	1-El	Left	Cent	R-r	Dart	C
			16	Opt	Circ-spl	Wet-d	Selec	Unit-j	3	9-1	Dbl chn		1-El	Plat	Left	Cent	R-r	Dayton	U
			12	Opt	Circ-spl	Wet-d	Selec	Unit-j	3	9-1	Dbl chn		1-El	Plat	Left	Cent	R-r	Dayton	A
None	None		30	Zephyr	Circ-spl	Cone	Selec	Unit-x	3	5-1	Sing chn		1-El	T-El	Left	Cent	R-r	Decatur	VI
None	None	2,000	25	Ray	Circ-spl	Dry-d	Selec	Unit-m	3	7-1	Int-gear	Springs	1-El	1-El	Right	Cent	Springs	Decatur	C
Cent	Motor	888	14	Strom	Spl-press	Cone	Selec	Unit-j	3	6-1	Dbl chn		1-El	1-El	Left	Cent	R-r	DeKalb	D1
Cent	Motor	750	12	Strom	Spl-press	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-El	1-El	Left	Cent	R-r	DeKalb	D2
Cent	Motor	1,317	18	Strom	Spl-press	Dry-d	Selec	Unit-m	3	7-1	Int-gear	Springs	1-El	1-El	Left	Cent	Springs	Denby	A
Cent	Motor	1,317	18	Strom	Circ-spl	Dry-d	Selec	Unit-m	3	7-1	Int-gear	Springs	1-El	1-El	Left	Cent	Springs	Denby	B
Suct	Motor	1,375	25	Strom	Circ-spl	Dry-d	Selec	Unit-m	3	4-1	Bevel	T-arm	1-El	1-El	Left	Cent	Springs	Dorris	IA4
Suct	Motor	946	15	Strom	Circ-spl	Dry-d	Selec	Unit-m	3	6-1	Dbl chn		1-El	1-El	Left	Cent	R-r	Dorris	IA4
Cent	Duplex	1,400	12	Scheb	Circ-spl	Wet-d	Selec	Unit-m	3	8-1	Int-gear-4	Springs	1-El	1-El	Left	Cent	Springs	Duplex	C
Cent	Duplex	1,400	12	Scheb	Circ-spl	Wet-d	Selec	Unit-m	3	8-1	Int-gear-4	Springs	1-El	1-El	Left	Cent	Springs	Duplex	D
None	None	1,000	20	Scheb	Splash	None	Fric	Amid	Any	4-1	Bevel	T-arm	1-El	Plat	Left	Cent	Springs	Fargo	E
			18	Ray	Circ-spl	Cone	Selec	Unit-m	3	6-1	Doub-r	T-arm	1-El	1-El	Left	Cent	Springs	Fargo	F
Cent	Motor	1,120	15	Strom	Circ-spl	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-El	1-El	Left	Cent	R-r	Federal	GH
Cent	Motor	1,190	15	Strom	Circ-spl	Cone	Selec	Amid	3	8-1	Top worm	Springs	1-El	1-El	Left	Cent	R-r	Federal	GW-HW
Cent	Motor	1,100	20	Marvel	Circ-spl	Cone	Selec	Amid	3	7-1	Doub-r	T-arm	1-El	1-El	Left	Cent	T-arm	Flint	C
Cent	Motor	1,200	15	Carter	Spl-press	Cone	Selec	Unit-j	3		Dbl chn		Comb	Comb	Left	Cent	R-r	Forschler	IA
Cent	Motor	1,000	14	Strom	Spl-press	Wet-d	Selec	Amid	3	9-1	Bevel-4	T-arm	1-El	Plat	Right	Right	Springs	Four Wheel Drive	G
Cent	Motor	1,000	14	Strom	Spl-press	Wet-d	Selec	Amid	3	9-1	Bevel-4	T-arm	1-El	Plat	Right	Right	Springs	Four Wheel Drive	B
Cent	Motor	1,000	10	Strom	Spl-press	Wet-d	Selec	Amid	3	12-1	Bevel-4	T-arm	1-El	Plat	Right	Right	Springs	Four Wheel Drive	M
None	None			Holley	Circ-spl	Cone	Prog	Unit-m	3	8-1	Int-gear	Springs	1-El	1-El	Right	Cent	Springs	Fremont-Mais	O

Carburetor Make, Strom, Stromberg, Scheb, Schaber, Ray, Rayfield; Excel, Excelior; King, Kingston; B-Z, Bress-Zephyr. Lubrication, Splash, non-circulating or simple splash; Circ-spl, circulating splash; Spl-press, splash-pressure; Fuel-inj, fuel injection, oil mixed with fuel; Pressure, pressure feed, no splash. Clutch Type, Dry-p, dry plate; Dry-d, dry multiple disk; Wet-d, wet disk or disk-in-oil; R-cone, reversed cone, or inverted cone; Exp-a, expanding shoe; Cont-b, contracting band. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, electric. Gearset Location, Amid, amidships; Unit-m, unit with motor; Unit-j, unit with jackshaft; Unit-x, unit with axle; Unit-a, unit drive shaft. Final Drive, Bevel, direct bevel; Doub-r, double-reduction, bevel and spur; Int-g, internal gear; Top worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -f, to front wheels; -a, to all four wheels. Driving Torque, R-r, radius rods; T-arm, torque-arm; Tor-t, torsion tube; Sub-f, sub-frame. Springs, Ellip, elliptic; 1-El, half-elliptic; 1-El, quarter-elliptic; 1-El, three-quarters-elliptic; Plat, platform; T-all, transverse elliptic; Cant, cantilever; Comb, combination of half-elliptic and elliptic on double frames. Steering, Cent, center; C&R, gearshift center, brake right; C&L, gearshift center, brake left. St-col, steering column. Propulsion R-r, radius rods; T-arm, torque arm; Tor-t, torsion tube; Sub-f, sub-frame.

Products of 377 Gasoline Truck Makers

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base in Inches	TIRES			Location	MOTOR				COOLING				IGNITION		
				Kind	SIZES IN INCHES			CYLINDERS	S.A.E H.P.	Cylinders Cast	Valves Placed	Water Circulation	Radiator Type	Type	Make	Spark Advance		
					Front	Rear											No.	Bore in Ins.
Gabriel.....K	1,000	1,200	112	Pneu....	32x4	32x4	Under hood..	4	3.50	5.00	19.61	Block	R&H	Cent	Z-s-t.	Sing	Bosch	Fixed
Gabriel.....H	1,500	1,600	126	Pneu....	34x4	34x4	Under hood..	4	3.75	5.25	22.50	Block	L&H	Cent	Z-s-t.	Sing	Bosch	Hand
Gabriel.....M	3,000	2,300	144	Pneu....	36x5	36x5d	Under hood..	4	4.12	5.25	27.20	Block	L&H	Cent	Z-s-t.	Sing	Bosch	Hand
Garford.....L	4,000	3,000	128*	Solid....	36x5	40x3d	Betw. seats..	4	4.25	5.25	36.15	Block	Left	Cent	Sq-t.	Dual	Bosch*	Hand
Garford.....J	6,000	3,500	128*	Solid....	36x5	40x4d	Betw. seats..	4	4.25	5.25	36.15	Block	Left	Cent	Sq-t.	Dual	Bosch*	Hand
Garford.....K	8,000	3,850	128*	Solid....	36x5	40x5d	Betw. seats..	4	4.25	5.25	36.15	Block	Left	Cent	Sq-t.	Dual	Bosch*	Hand
Garford.....D	10,000	4,500	128*	Solid....	36x6	40x6d	Betw. seats..	4	4.25	5.25	29.00	Block	Left	Cent	Sq-t.	Dual	Bosch*	Hand
Garford.....F	12,000	4,850	128*	Solid....	36x6	40x7d	Betw. seats..	4	4.25	5.25	29.00	Block	Left	Cent	Sq-t.	Dual	Bosch*	Hand
GASchacht.....2	4,000	2,800	138	Solid....	38x3	40x3d	Under hood..	4	4.25	5.50	29.00	Block	R&H	Cent	Cell	Sing	Eisemann	Hand
GASchacht.....3	6,000	3,200	150	Solid....	38x4	40x4d	Under hood..	4	4.25	5.50	29.00	Block	R&H	Cent	Cell	Sing	Eisemann	Hand
Gemeva.....B	1,500	700	96	Solid....	34x2	36x2	Under hood..	2	5.12	4.50	21.10	Sing		Gear	Finned	Sing	Opt	Fixed
GMC.....15	1,500	1,090	122	Pneu....	35x5	35x5	Under hood..	4	3.50	5.00	19.61	Block	Right	Cent	Finned	Sing	Eisemann	Hand
GMC.....VC	2,500	1,500	126	Solid....	34x3	36x5	Under hood..	4	3.50	5.25	19.61	Block	Right	Cent	Finned	Sing	Bosch	Hand
GMC.....SC	4,000	1,900	143	Solid....	34x4	36x3d	Under hood..	4	4.00	6.00	25.60	Block	Right	Cent	Finned	Sing	Bosch	Hand
GMC.....HU	7,000	2,500	158	Solid....	36x5	42x5d	Under hood..	4	5.00	5.00	40.00	Pairs.	Left	Cent	Finned	Double	Mea.	Hand
GMC.....KU	10,000	3,000	158	Solid....	36x6	42x6d	Under hood..	4	5.00	5.00	40.00	Pairs.	Left	Cent	Finned	Double	Mea.	Hand
Gramm.....1	3,000	2,600	129	Solid....	34x3	38x5	Betw. seats..	4	3.75	5.25	22.50	Block	Left	Cent	Sq-t.	Sing	Mea.	Hand
Gramm.....2	4,000	3,600	128	Solid....	36x4	36x3d	Betw. seats..	4	4.50	5.50	32.40	Pairs.	Left	Cent	Sq-t.	Sing	Mea.	Hand
Gramm.....3	7,000	4,600	140	Solid....	36x5	36x5d	Betw. seats..	4	4.50	5.50	32.40	Pairs.	Left	Cent	Sq-t.	Sing	Mea.	Hand
Gramm.....5	10,000	5,350	140	Solid....	36x6	40x6d	Betw. seats..	4	4.50	5.50	32.40	Pairs.	Left	Cent	Sq-t.	Sing	Mea.	Hand
Harvey.....F	3,000	1,800	130	Solid....	34x3	38x5	Under hood..	4	3.75	5.50	22.50	Block	Right	Cent	Z-s-t.	Sing	Eisemann	Auto
Harvey.....H	6,000	3,000	168	Solid....	36x5	40x5d	Under hood..	4	4.25	5.50	29.00	Block	Left	Cent	Z-s-t.	Sing	Eisemann	Auto
Herner.....1	2,000	2,000	145	Solid....	34x3	34x4	Under hood..	4	4.12	5.25	27.20	Block	Left	Gear	Finned	Dual	Bosch	Hand
Herner.....1	3,000	2,250	145	Solid....	36x4	36x5	Under hood..	4	4.12	5.25	27.20	Block	Left	Gear	Finned	Dual	Bosch	Hand
Herner.....2	4,000	2,650	145	Solid....	36x4	36x3d	Under hood..	4	4.12	5.25	27.20	Block	Left	Gear	Finned	Dual	Bosch	Hand
Herner.....3	6,000	3,200	145	Solid....	36x5	40x4d	Under hood..	4	4.50	5.50	32.40	Pairs.	Left	Cent	Finned	Dual	Bosch	Hand
Herner.....5	10,000	4,200	156	Solid....	38x6	42x6d	Under hood..	4	5.25	5.75	44.20	Pairs.	Opp	Gear	Finned	Dual	Bosch	Hand
Hupmobile.....HT	800	850	106	Pneu....	33x4	33x4	Under hood..	4	3.25	5.50	16.92	Block	Left	Thermo	Cell	Sing	Bosch	Hand
I. H. C.....M	1,000		90	Solid....	42x2	42x2	Under seat....	2	4.50	5.00	16.20	Sing	Head	Cent	Finned	Dual	Heinze	Hand
Independent.....F	1,500	1,285	112*	Solid....	36x3	36x3	Under hood..	4	3.50	5.00	19.61	Block	Right	Thermo	Z-s-t.	Sing	Mea.	Hand
Independent.....E	3,000	1,850	122*	Solid....	36x3	36x5	Under hood..	4	3.75*	5.25	22.50	Block	Left	Cent	Z-s-t.	Sing	Mea.	Hand
Indiana.....B	3,000	1,800	135	Solid....	36x3	36x5	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent	Finned	Dual	Bosch	Hand
Indiana.....F	6,000	2,500	144	Solid....	36x4	36x3d	Under hood..	4	4.25	5.25	29.00	Sing	Left	Cent	Finned	Dual	Bosch	Hand
Indiana.....K	10,000	3,200	165	Solid....	36x5	40x4d	Under hood..	4	4.75	5.00	36.15	Sing	Left	Cent	Finned	Dual	Bosch	Hand
Jeffery.....1515	1,500	1,300	118	Pneu....	34x4	34x4	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent	Sq-t.	Dual	Remy	Hand
Jeffery.....3015	3,000	1,650	130	Solid....	34x3	34x5	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent	Sq-t.	Dual	Remy	Hand
Jeffery.....4015	4,000	2,750	124	Solid....	36x5	36x5	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent	Z-s-t.	Dual	Bosch	Hand
Kalamazoo.....B	3,000	1,590	126	Solid....	37x3	37x5	Under hood..	4	3.75	5.50	22.50	Block	Right	Cent	Z-s-t.	Sing	Bosch	Hand
Kelly.....K-30	2,000	2,000	120*	Solid....	36x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent	Cell	Sing	Eisemann	Auto
Kelly.....K-35	4,000	2,750	144*	Solid....	36x4	36x4d	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent	Cell	Sing	Eisemann	Auto
Kelly.....K-40	7,000	3,400	150*	Solid....	38x5	38x5d	Under hood..	4	4.50	6.50	32.40	Pairs.	Opp	Cent	Cell	Sing	Eisemann	Auto
Kelly.....K-50	10,000	4,250	150*	Solid....	38x6	40x6d	Under hood..	4	4.50	6.50	32.40	Pairs.	Opp	Cent	Cell	Sing	Eisemann	Auto
King.....3	7,000	3,200	120	Solid....	36x5	36x5d	Under floor..	4	4.50	5.50	32.40	Pairs.	Left	Cent	Z-s-t.	Dual	Bosch	2-pt.
Kisselkar.....1500	1,500	1,500	125	Pneu....	35x4	35x4	Under hood..	4	4.25	5.25	29.00	Pairs.	Left	Cent	Sq-t.	Dual	Bosch	Hand
Kisselkar.....1	2,000	1,850	140	Pneu....	37x5	37x5	Under hood..	4	4.50	5.25	32.40	Pairs.	Left	Cent	Sq-t.	Dual	Bosch	Hand
Kisselkar.....1	3,000	2,100	132*	Solid....	34x3	38x5	Under hood..	4	4.25	5.25	29.00	Pairs.	Left	Cent	Sq-t.	Dual	Bosch	Hand
Kisselkar.....2	5,000	2,750	144*	Solid....	36x4	38x4d	Under hood..	4	4.50	5.25	32.40	Pairs.	Left	Cent	Sq-t.	Dual	Bosch	Hand
Kisselkar.....3	7,000	3,350	162	Solid....	36x5	40x5d	Under hood..	4	4.87	5.00	38.25	Pairs.	Left	Cent	Sq-t.	Dual	Bosch	Hand
Kisselkar.....6	12,000	4,350	168	Solid....	36x6	40x6d	Under hood..	4	4.87	5.00	38.25	Pairs.	Left	Cent	Sq-t.	Dual	Bosch	Hand
Kleiber.....1	3,000	2,000	140*	Solid....	36x3	36x5d	Under hood..	4	4.12	5.25	27.20	Block	Left	Cent	Z-s-t.	Dual	Bosch*	Hand*
Kleiber.....2	5,000	2,750	150*	Solid....	36x4	36x4d	Under hood..	4	4.12	5.25	27.20	Block	Left	Cent	Z-s-t.	Dual	Bosch*	Hand*
Kleiber.....3	7,000	3,300	160*	Solid....	36x4	36x5d	Under hood..	4	4.50	5.50	32.40	Pairs.	Left	Cent	Z-s-t.	Dual	Bosch*	Hand*
Kleiber.....5	10,000	4,000	170	Solid....	36x5	40x6d	Under hood..	4	5.00	5.75	40.00	Pairs.	Opp	Cent	Z-s-t.	Dual	Bosch*	Hand*
Knox Tractor.....31	12,000	3,250	139	Solid....	34x5	36x5d	Under hood..	4	5.00	5.50	40.00	Sing	Head	Cent	Cell	Dual-d	Bosch	Hand
Knox Tractor.....32	20,000	3,750	140	Solid....	34x5	38x6d	Under hood..	4	5.00	5.50	40.00	Sing	Head	Cent	Cell	Dual-d	Bosch	Hand
Koehler.....1	2,000	725	90	Solid....	36x2	36x2	Under body..	2	5.25	4.00	22.10	Sing	Top	Thermo	Finned	Sing		Fixed
Kosmath.....14	1,000	850	110	Pneu....	32x3	34x4	Under hood..	4	3.50	4.00	19.61	Pairs.	Right	Cent	Finned	Sing	Eisemann	Fixed
Krebs.....G	2,000	1,900	118	Solid....	34x3	34x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent	Finned	Sing	Bosch	Auto
Krebs.....H	4,000	2,350	144*	Solid....	36x4	36x6	Under hood..	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Sing	Bosch	Auto
LaFrance.....6	10,000	5,500	140	Solid....	36x5	38x6d	Under hood..	4	5.50	6.00	48.48	Pairs.	Opp	Cent	Cell	Dual	Bosch	Fixed
Lambert.....V1	800	900	106	Pneu....	30x3	31x4	Under hood..	4	3.75	4.50	22.50	Pairs.	Right	Cent	Cell	Sing	Bosch	Fixed
Lambert.....V2	1,500	1,125	114	Pneu.*	33x4*	33x4*	Under hood..	4	3.75	4.50	22.50	Pairs.	Right	Cent	Cell	Sing	Bosch	Fixed
Lambert.....V3	2,000		120	Solid....	36x3	36x3	Under hood..	4	4.06	4.50	26.27	Block	Left	Cent	Cell	Dual	Briggs	Hand
Lambert.....V4	3,000	1,900	120	Solid....	36x4	36x4	Under hood..	4	4.50	5.00	32.40	Pairs.	Left	Cent	Cell	Dual	Briggs	Hand
Lambert.....V5	4,000	2,200	120	Solid....	36x4	36x5	Under hood..	4	4.50	5.00	32.40	Pairs.	Left	Cent	Cell	Dual	Briggs	Hand
Lange.....C	3,000	2,250	125	Solid....	36x3	38x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Thermo	Sq-t.	Double	Conn	Hand
Lange.....B	5,000	3,000	136	Solid....	36x4	38x6	Under hood..	4	4.12	5.25	27.20	Block	Left	Thermo	Sq-t.	Double	Conn	Hand
Lewis.....21	5,000	2,900	144	Solid....	34x3	36x3d	Under hood*	4	4.25	5.00	29.00	Pairs.	Opp	Cent	Sq-t.	Dual	Bosch	Hand
Lewis.....31	6,000	3,250	144	Solid....	34x4	36x5d	Under hood*	4	4.25	5.00	29.00	Pairs.	Opp	Cent	Sq-t.	Dual	Bosch	Hand
Lewis.....51	10,000	4,400	144*	Solid....	36x6	38x6d	Under floor..	4	4.75	5.50	36.15	Pairs.	Opp	Cent	Sq-t.	Dual	Bosch	Hand

ABBREVIATIONS: General, *, with other options; Opt, optional. Price, -, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; Pds, pneumatic in front, solid in rear; Pdc, pneumatic in front, cushion in rear. C&S, cushion in front, solid in rear. Tire Sizes, d, dual. Motor Location, Between seats, between seats. Cylinder Cast, Sing, singly or individually. Location of Valves, Opp, opposite, or T-head type; Top (2-cylinder motors only). L-head cylinder laid horizontal with valves up; R&H, at right and in head, L-head cylinder; L&H, at left and in head, L-head cylinder; 2-cyc, two-cycle motor, no valves; Back, L-head motor placed transversely with valves at rear. Water Circulation, Cent, centrifugal pump; Gear, gear pump; Thermo, thermo-siphon circulation; Air, air-cooled, no water. Radiator Type, Finned, finned-tube; Cell, cellular or honeycomb; Sq-t, square-tube or flat-tube; Z-s-t, zig-zag-tube or crimped flat-tube. Ignition, Type, Sing, single; Doub, double; Dual-d, dual-double. Make of Magneto (or other sparking device), Split, Splitdorf; Conn, Connecticut; King, Kingston; West, Westinghouse; Day-D, Dayton-Dick; Atw-K, Atwater-Kent. Spark Advance, Auto, automatic; 2-pt, two-point fixed, battery circuit fixed in retard, magneto in advance. Governor Type, Cent, centrifugal; L-b, loose-ball; Suct, suction; Hyd, hydraulic. Governor Drive, Motor, from motor; D-shaft, from driving shaft; F-wheel, from front wheel; Gearset, from gearset countershaft; Duplex, from both the motor and the driving shaft, by overrunning clutches.

in Tabulated Form for Quick Comparison

MOTOR						TRANSMISSION						SPRINGS		CONTROL		Propulsion Taken By	Name and Model			
GOVERNOR		SPEEDS		Carbur-eter Make	Lubrica-tion	Clutch Type	GEARSET			Total Gear-Ratio in High	Final Drive	Torque Taken By	Front	Rear	Steer			Levers		
Type	Drive	Motor in R.p.m.	Truck in M.p.h.				Type	Location	Speeds											
			30	Opt.....	Spl-press.	Cone.....	Selec.....	Unit-m.....	3	4 -1	Bevel.....	T-arm.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Gabriel.....	K	
			35	Strom.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	4-1-1	Bevel.....	T-arm.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Gabriel.....	H	
			20	Strom.....	Spl-press.	Cone.....	Selec.....	Amid.....	4	8 -1	Bevel.....	T-arm.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Gabriel.....	M	
Cent.....	Motor...	1,140	14½	Own.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	3	9½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Garford.....	L	
Cent.....	Motor...	1,140	12½	Own.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	3	10½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Garford.....	J	
Cent.....	Motor...	1,140	10½	Own.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	3	12½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Garford.....	D	
Cent.....	Motor...	1,140	10½	Own.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	4	13-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Garford.....	F	
Cent.....	Motor...	1,140	8½	Own.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	4	15-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Garford.....	F	
Cent.....	Motor...	1,000	15	Scheb.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	7½-1	Top-worm.....	T-arm.....	1-El.....	Plat.....	Left.....	Cent.....	R-r.....	GASchacht.....	2	
Cent.....	Motor...	1,000	12	Scheb.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	9½-1	Top worm.....	T-arm.....	1-El.....	Plat.....	Left.....	Cent.....	R-r.....	GASchacht.....	3	
			18	Scheb.....	Spl-press.	Wet-d.....	Plan.....	Unit-j.....	2	8 -1	Dbl chn.....		1-El.....	Ellip.....	Right.....	Right.....	R-r.....	Geneva.....	B	
Suct.....	Motor...	1,150	20	Marvel.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	6 -1	Bevel.....	R-r.....	1-El.....	Ellip.....	Left.....	Cent.....	R-r.....	GMC.....	15	
Cent.....	Motor...	1,130	14	King.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	3	9 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	GMC.....	VC	
Cent.....	Motor...	900	12	King.....	Spl-press.	Cone.....	Selec.....	Unit-j.....	3	8 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	GMC.....	SC	
Cent.....	Motor...	800	11	Marvel.....	Spl-press.	Wet-d.....	Prog.....	Unit-j.....	3	9 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	GMC.....	HU	
Cent.....	Motor...	800	8½	Marvel.....	Spl-press.	Wet-d.....	Prog.....	Unit-j.....	3	12 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	GMC.....	KU	
Cent.....	Motor...			Opt.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3		Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Gramm.....	1½	
Cent.....	Motor...			Opt.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3		Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Gramm.....	2	
Cent.....	Motor...			Opt.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3		Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Gramm.....	3½	
Cent.....	Motor...			Opt.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3		Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Gramm.....	5	
L-b.....	Motor...	1,000	16	Holley.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3	8½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Harvey.....	F	
L-b.....	Motor...	900	10	Holley.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	4	10½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Harvey.....	H	
Cent.....	Motor...	1,200	19	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	6-1-1	Dbl chn.....		1-El.....	Plat.....	Left.....	Cent.....	R-r.....	Hornor.....	1	
Cent.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	7-1-1	Dbl chn.....		1-El.....	Plat.....	Left.....	Cent.....	R-r.....	Hornor.....	1½	
Cent.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	9-1-1	Dbl chn.....		1-El.....	Plat.....	Left.....	Cent.....	R-r.....	Hornor.....	2	
Cent.....	Motor...	1,140	12	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	9-1-1	Dbl chn.....		1-El.....	Plat.....	Left.....	Cent.....	R-r.....	Hornor.....	3	
Cent.....	Motor...	1,000	10	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	13½-1	Dbl chn.....		1-El.....	Plat.....	Left.....	Cent.....	R-r.....	Hornor.....	5	
Cent.....	Motor...	1,500	20	Zenith.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	4 -1	Bevel.....	Tor-t.....	1-El.....	Plat.....	Right.....	Cent.....	Tor-t.....	Hupmobile.....	HT	
				Scheb.....	Spl-press.	Cont-b.....	Ind-c.....	Unit-m.....	2	9½-1	Dbl chn.....		Ellip.....	Ellip.....	Right.....	Right.....	R-r.....	I. H. C.....	M	
Cent.....	Motor...	1,350	18	Zephyr.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	7½-1	Top worm.....	Spring.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Independent.....	F	
Cent.....	Motor...	1,200	15	Zephyr.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3	8½-1	Dbl chn.....		1-El.....	Plat.....	Right.....	Right.....	R-r.....	Independent.....	E	
L-b.....	D-shft...	1,200	17½	Scheb.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-j.....	3	7½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Indiana.....	B	
L-b.....	D-shft...	1,200	15½	Scheb.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-j.....	3	8-1-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Indiana.....	F	
L-b.....	D-shft...	1,200	14½	Scheb.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-j.....	3	9½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Indiana.....	K	
Suct.....	Motor...	1,100	22	Strom.....	Spl-press.	Dry-p.....	Selec.....	Amid.....	3	4 -1	Bevel.....	Tor-t.....	1-El.....	1-El.....	Left.....	Cent.....	Tor-t.....	Jeffery.....	1515	
Suct.....	Motor...	1,100	15	Strom.....	Spl-press.	Dry-p.....	Selec.....	Unit-j.....	3	7½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Jeffery.....	3015	
Suct.....	Motor...	1,100	14½	Strom.....	Spl-press.	Dry-p.....	Selec.....	Amid.....	4	7½-1	Int-g4.....	Spring.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Jeffery.....	4015	
Cent.....	D-shft...	1,600	15	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3		Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kalamazoo.....	B	
L-b.....	Motor...	1,200	15	Breeze.....	Pressure.....	Cone.....	Selec.....	Amid.....	3	8½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kelly.....	K-30	
L-b.....	Motor...	1,200	11½	Breeze.....	Pressure.....	Cone.....	Selec.....	Amid.....	3	11½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kelly.....	K-35	
L-b.....	Motor...	900	9½	Ray.....	Pressure.....	Cone.....	Selec.....	Amid.....	3	11-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kelly.....	K-40	
L-b.....	Motor...	900	8½	Ray.....	Pressure.....	Cone.....	Selec.....	Amid.....	3	12½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kelly.....	K-50	
Cent.....	Motor...	950	12	Scheb.....	Circ-spl.....	Dry-d.....	Ind-c.....	Unit-j.....	3	8½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	King.....	3½	
Cent.....	Motor...	1,200	25	Strom.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	3	5 -1	Bevel.....	Tor-t.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Kisselkar.....	1500	
Cent.....	Motor...	1,200	25	Strom.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	4	4½-1	Bevel.....	Tor-t.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Kisselkar.....	1	
Cent.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	4	8 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kisselkar.....	1½	
Cent.....	Motor...	1,200	12	Strom.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	4	10 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kisselkar.....	2½	
Cent.....	Motor...	1,200	11	Strom.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	4	11 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kisselkar.....	3½	
Cent.....	Motor...	1,200	10	Strom.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	4	12½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Kisselkar.....	6	
Cent.....	Motor...	1,200	18	Scheb*.....	Circ-spl.....	Wet-d.....	Selec.....	Unit-j.....	3	7 -1*	Dbl chn.....		1-El.....	1-El.....	Right.....	Cent.....	R-r.....	Kleiber.....	1	
Cent.....	Motor...	1,200	16	Scheb*.....	Circ-spl.....	Wet-d.....	Selec.....	Unit-j.....	3	9½-1*	Dbl chn.....		1-El.....	1-El.....	Right.....	Cent.....	R-r.....	Kleiber.....	2	
Cent.....	Motor...	1,100	14	Scheb*.....	Circ-spl.....	Wet-d.....	Selec.....	Unit-j.....	3	9 -1*	Dbl chn.....		1-El.....	1-El.....	Right.....	Cent.....	R-r.....	Kleiber.....	3	
Cent.....	Motor...	1,000	12	Scheb*.....	Circ-spl.....	Wet-d.....	Selec.....	Unit-j.....	3	9½-1*	Dbl chn.....		1-El.....	1-El.....	Right.....	Cent.....	R-r.....	Kleiber.....	5	
Cent.....	Motor...	1,100	12	Strom.....	Pressure.....	Dry-p.....	Selec.....	Amid.....	3	11 -1	Dbl chn.....		1-El.....	Cant.....	Right.....	Cent.....	R-r.....	Knox Tractor.....	31	
Cent.....	Motor...	1,100	10½	Strom.....	Pressure.....	Dry-p.....	Selec.....	Unit-j.....	3	12½-1	Dbl chn.....		1-El.....	Cant.....	Right.....	Cent.....	R-r.....	Knox Tractor.....	32	
			20	King.....	Splash.....	Cone.....	Plan.....	Unit-j.....	2	8 -1*	Dbl chn.....		1-El.....	Ellip.....	Left.....	Cent.....	R-r.....	Koehler.....	1	
			1,100	25	Holley.....	Splash.....	Cone.....	Selec.....	Unit-m.....	3	4 -1	Bevel.....	R-r.....	1-El.....	Ellip.....	Left.....	Cent.....	R-r.....	Kosmath.....	14
Cent.....	Motor...	1,025	15	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	3	6½-1	Top worm.....	Spring.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Krebs.....	G	
Cent.....	Motor...	1,100	15	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	3	7½-1	Top worm.....	Spring.....	1-El.....	1-El.....	Left.....	Cent.....	Spring.....	Krebs.....	H	
Cent.....	Motor...	1,200	12	Scheb.....	Spl-press.....	None.....	Hyd.....	Unit-j.....	Any	10½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	LaFrance.....	6	
				Excel.....	Spl-press.....	None.....	Fric.....	Amid.....	Any	3½-1	Sing chn.....		1-El.....	Ellip.....	Right.....	Right.....	R-r.....	Lambert.....	V1	
				Excel.....	Spl-press.....	None.....	Fric.....	Amid.....	Any	6 -1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Lambert.....	V2	
				Scheb.....	Spl-press.....	None.....	Fric.....	Amid.....	Any	6 -1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Lambert.....	V3	
Suct.....	Motor...	800	10	Scheb.....	Spl-press.....	None.....	Fric.....	Amid.....	Any	10½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Lambert.....	V4	
Suct.....	Motor...	800	9	Scheb.....	Spl-press.....	None.....	Fric.....	Amid.....	Any	10½-1	Dbl chn.....		1-El.....	1-El.....	Right.....	Right.....	R-r.....	Lambert.....	V5	
Cent.....	Motor...	1,250	18	Strom.....	Circ-spl.....	Wet-d.....	Ind-c.....	Unit-j.....	3	8 -1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Lange.....	C	
Cent.....	Motor...	1,250	15	Strom.....	Circ-spl.....	Wet-d.....	Ind-c.....	Unit-j.....	3	9½-1	Dbl chn.....		1-El.....	1-El.....	Left.....	Cent.....	R-r.....	Lange.....	B	
Cent.....	Motor...	1,200	14	Ray.....	Spl-press.....	Wet-d.....	Ind-c.....	Amid.....	3	8 -1	Dbl chn.....		1-El.....	Plat.....	Right.....	Right.....	R-r.....	Lewis.....	21	
Cent.....	Motor...	1,200	12	Ray.....	Spl-press.....	Wet-d.....	Ind-c.....	Amid.....	3	8½-1	Dbl chn.....		1-El.....	Plat.....	Right.....	Right.....	R-r.....	Lewis.....	31	
Cent.....	Motor...	1,000	10	Ray.....	Spl-press.....	Wet-d.....	Ind-c.....	Amid.....	3	10½-1	Dbl chn.....		1-El.....	Plat.....	Right.....	Right.....	R-r.....	Lewis.....	51	

Carbur-eter Make, Strom, Stromberg; Scheb, Schebler; Ray, Rayfield; Excel, Excelior; King, Kingston; B-Z, Bress-Zephyr. Lubrication, Splash, non-circulating or simple splash; Circ-spl, circulating splash; Spl-press, splash-pressure; Fuel-inj, fuel injection, oil mixed with fuel; Pressure, pressure feed, no splash. Clutch Type, Dry-p, dry plate; Dry-d, dry disk; Wet-d, wet disk or disk-in-oil; R-cone, reversed cone or inverted cone; Exp-e, expanding shoe; Cont-b, contracting band. Gearset Type, Prog, progressive sliding gear; Sele, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-club; Fric, friction; Hyd, hydraulic; Elec, electric. Gearset Location, Amid, amidships; Unit-m, unit with motor; Unit-j, unit with jackshaft; Unit-s, unit with axle; Unit-a, unit drivehaft. Final Drive, Bevel, direct bevel; Doub-t, double-reduction, bevel and spur; Int-g, internal gear; Top worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; 4, to front wheels; 4, to all four wheels. Driving Torque, R-r, radius rods; T-arm, torque-arm; Tor-t, torsion tube, Sub-f, sub-frame. Springs, Ellip, elliptic; 1-El, half-elliptic; 1-El, quarter-elliptic; 1-El, three-quarter-elliptic; Plat, platform; T-ell, transverse elliptic; Cant, cantilever; Comb, combination of half-elliptic and elliptic on double frames. Steering, Cent, center. Levers, Cent, center; Cdr, gearshift center, brake right; Cdl, gearshift enter, brake left, St-eol, steering column. Propulsion, R-r, radius rods; T-arm, torque arm; Tor-t, torsion tube; Sub-f, sub-frame.

Products of 377 Gasoline Truck Makers

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base in Inches	TIRES			MOTOR											
				Kind	SIZES IN INCHES		Location	CYLINDERS			S.A.E. H.P.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear		No.	Bore in Ins.	Stroke in Ins.				Water Circulation	Radiator Type	Type	Make	Spark Advance
Lippard-Stew. B*	1,500	1,650	115*	Pneu.	35x4	35x4	Under hood	4	3.75	5.25	22.50	Block	Left	Cent	Finned	Sing	Eisemann	Fixed
Lippard-Stew. BW*	1,500	1,775	115*	Pneu.	35x4	35x4	Under hood	4	3.75	5.25	22.50	Block	Left	Cent	Finned	Sing	Eisemann	Fixed
Lippard-Stew. H	2,000	2,000	145	Solid	36x3	36x5	Under hood	4	3.75	5.25	22.50	Block	Left	Cent	Finned	Sing	Eisemann	Fixed
Lippard-Stew. F	3,000	2,300	145*	Solid	36x3	36x3d	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Sing	Eisemann	Fixed
Lippard-Stew. G	4,000	2,600	158*	Solid	36x4	36x4d	Under hood	4	4.15	5.25	27.20	Block	Left	Cent	Finned	Sing	Eisemann	Fixed
Little Giant. H	2,000	1,350	110	Solid	37x3	37x3	Under floor	4	3.75	4.50	22.50	Block	Right	Thermo	Finned	Dual	King	Hand
Locomobile. A2	10,000	4,500	140*	Solid	40x6	40x6d	Under floor	4	5.00	6.00	40.00	Pairs	Opp	Cent	Cell	Dual	Bosch	Hand
Locomobile. AA2	12,000	4,800	140*	Solid	40x7	40x7d	Under floor	4	5.00	6.00	40.00	Pairs	Opp	Cent	Cell	Dual	Bosch	Hand
M&E. B	7,000	3,500	132	Solid	36x6	36x5d	Under hood	4	4.50	5.50	32.40	Block	Right	Cent	Sq-4	Double	Bosch	Hand
M&E. G	10,000	2,750	116	Sol-st.	36x5d	40x6	Under hood	4	4.25	5.25	29.00	Pairs	Right	Cent	Sq-4	Double	Bosch	Hand
Maccar. B	2,000	1,900	138*	Solid	36x4	36x5	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Dual	Eisemann	Hand
Maccar. E	2,000	1,900	138*	Solid	36x4	36x5	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Dual	Eisemann	Hand
Maccar. C	3,000	2,150	150*	Solid	36x4	36x6	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Dual	Eisemann	Hand
Maccar. F	4,000	2,400	150*	Solid	36x4	36x4d	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Dual	Eisemann	Hand
Maccar. D	4,000	2,400	150*	Solid	36x4	36x4d	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Dual	Eisemann	Hand
McIntyre. E	1,500	.....	120	Solid	34x3	34x3	Under hood	4	3.75	5.00	22.50	Block	Right	Thermo	Cell	Sing	Bosch	Hand
McIntyre. A	3,000	.....	144	Solid	34x3	36x3d	Under hood	4	4.12	5.25	27.20	Block	Left	Thermo	Cell	Sing	Bosch	Hand
McIntyre. G	6,000	.....	144	Solid	36x4	36x4d	Under hood	4	4.12	5.25	27.20	Block	Left	Thermo	Cell	Sing	Bosch	Hand
Mais. C	3,000	2,750	119	Solid	37x4	37x5	Under hood	4	4.00	5.25	25.60	Block	Opp	Cent	Cell	Sing	Eisemann	Auto
Mais. D	3,000	2,800	132	Solid	37x4	37x5	Under hood	4	4.00	5.25	25.60	Block	Opp	Cent	Cell	Sing	Eisemann	Auto
Mais. E	4,000	2,950	132	Solid	37x4	37x4d	Under hood	4	4.00	5.25	25.60	Block	Opp	Cent	Cell	Sing	Eisemann	Auto
Mais. F	4,000	3,000	145	Solid	37x4	37x4d	Under hood	4	4.00	5.25	25.60	Block	Opp	Cent	Cell	Sing	Eisemann	Auto
Mais. G	5,000	3,200	145	Solid	37x5	37x4d	Under hood	4	4.31	5.25	29.69	Block	Opp	Cent	Cell	Sing	Eisemann	Auto
Mais. H	6,000	3,400	160	Solid	37x5	37x5d*	Under hood	4	4.31	5.25	29.69	Pairs	Opp	Cent	Cell	Sing	Eisemann	Auto
Mais. Tractor	16,000	2,750	84	Solid	37x4	37x7	Under hood	4	4.31	5.25	29.69	Block	Opp	Cent	Cell	Sing	Eisemann	Auto
Martin. R	2,000	2,050	125	Solid	36x3	36x4	Under hood	4	4.00	5.00	25.60	Block	Left	Cent	Finned	Dual	Remy	Hand
Martin. S	3,000	2,150	121	Solid	36x3	40x4	Under floor	4	4.00	5.00	25.60	Block	Left	Cent	Finned	Dual	Remy	Hand
Martin. E	5,000	3,000	135	Solid	36x4	40x3d	Under floor	4	4.25	5.00	27.20	Pairs	Opp	Cent	Finned	Dual	Remy	Hand
Martin. L	7,000	3,500	145	Solid	36x5	40x4d	Under floor	4	4.75	5.50	36.15	Pairs	Opp	Cent	Finned	Dual	Remy	Hand
Menominee. A3	1,500	1,125	112	Solid	33x3	33x3	Under hood	4	3.75	4.50	22.50	Pairs	Left	Cent	Finned	Dual	Bosch	Hand
Menominee. B3	2,000	1,400	122	Solid	34x3	34x4	Under hood	4	4.00	5.00	25.60	Pairs	Left	Thermo	Finned	Dual	Bosch	Hand
Menominee. C	3,000	1,800	130	Solid	36x4	36x5	Under hood	4	4.00	5.00	25.60	Pairs	Left	Thermo	Finned	Dual	Bosch	Hand
Mercury. P	1,000	.....	84	Solid	38x2	40x2	Under floor	2	4.25	4.00	14.50	Sing	Opp	Air	.....	Dual	Remy	Fixed
Modern. L	2,000	1,750	136	Solid*	36x3	36x3	Under hood	4	3.75	5.25	22.50	Block	Right	Cent	Cell	Dual	Bosch	Hand
Modern. H	3,000	1,950	136*	Solid	36x4	36x5*	Under hood	4	4.12	5.25	27.20	Block	Right	Cent	Cell	Dual	Bosch	Hand
Modern. M	3,000	2,000	136*	Solid	36x4	36x5*	Under hood	4	4.12	5.25	27.20	Block	Right	Cent	Cell	Dual	Bosch	Hand
Moen. B	3,000	1,800	125*	Solid	36x3	36x4	Under hood	4	3.75	5.25	22.50	Block	Left	Gear	Cell	Dual	Remy	Hand
Moore. 1	3,000	1,950	145	Solid	37x3	37x4	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Sq-t	Dual	Bosch	Hand
Moore. 2	4,000	2,500	163	Solid	37x4	37x3d	Under hood	4	4.50	5.50	32.40	Pairs	Left	Cent	Sq-t	Dual	Bosch	Hand
Moore. 3	6,000	3,150	142	Solid	37x5	37x4d	Under floor	4	4.60	5.60	32.40	Pairs	Left	Cent	Sq-t	Dual	Bosch	Hand
Moore. 4	8,000	3,500	153	Solid	37x5	37x5d	Under floor	4	4.75	5.50	36.15	Pairs	Opp	Cent	Sq-t	Dual	Bosch	Hand
Moore. 5	10,000	4,500	175	Solid	37x6	42x6d	Under floor	4	5.25	7.00	44.20	Pairs	Opp	Cent	Sq-t	Dual	Bosch	Hand
Morland. 7X	1,500	1,800	126	Solid*	34x3	34x3	Under hood	4	3.75	5.25	22.50	Block	Left	Cent	Finned	Sing	West	Hand
Morland. 1X	3,000	2,050	120	Solid	34x3	34x5	Under floor	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Sing	West	Hand
Morland. 2X	5,000	2,650	144	Solid	34x4	34x4d	Under floor	4	4.50	5.50	32.40	Pairs	Left	Cent	Finned	Sing	West	Hand
Morland. 3X	7,000	3,500	168	Solid	36x5	38x5d	Under floor	4	4.75	5.75	36.15	Pairs	Left	Cent	Finned	Sing	West	Hand
Morland. 5X	10,000	4,000	168	Solid	36x6	40x6d	Under floor	4	4.75	6.75	36.15	Pairs	Left	Cent	Finned	Sing	Bosch	Hand
Morland. 6X	13,000	4,500	168	Solid	36x5	40x6d	Under floor	4	5.25	7.00	44.20	Pairs	Opp	Cent	Finned	Sing	Bosch	Hand
Metokart. 1&2	500	365	60	Pneu	26x2	26x2	Under seat	2	3.62	4.00	10.53	Sing	Head	Thermo	Sq-t	Sing	None	Hand
Natco. 20	2,000	1,925	104	Solid	36x3	36x3	Betw seats	4	3.50	5.00	19.61	Block	Right	Thermo	Finned	Sing	U & H	Fixed
Nelson & LeM. E1	2,000	1,800	Opt.	Solid	36x3	36x4	Under hood	4	3.75	5.25	22.50	Block	L&H	Cent	Finned	Dual	Bosch	Fixed
Nelson & LeM. E1	3,000	2,000	Opt.	Solid	36x4	36x5	Under hood	4	4.12	5.25	27.20	Block	L&H	Cent	Finned	Dual	Bosch	Hand
Nelson & LeM. E2	4,000	2,250	Opt.	Solid	36x4	36x6	Under hood	4	4.12	5.25	27.20	Block	L&H	Cent	Finned	Dual	Bosch	Hand
Natco. C	3,000	2,250	144	Solid	36x3	36x5	Under hood	4	4.12	5.25	27.20	Block	Left	Cent	Finned	Sing	Eisemann	Fixed
New York. L	3,000	2,000	129	Solid	36x3	36x5	Under hood	4	3.75	5.25	22.50	Block	Left	Cent	Sq-t	Sing	Bosch	Fixed
O. K. C&D	1,200	875	112	Pneu	33x4	33x4	Under hood	4	3.50	5.00	19.61	Block	R&H	Thermo	Z-s-t	Sing	Bosch	Fixed
Old Hickory. 30W	3,000	1,900	110	Solid	33x3	33x4	Under floor	4	3.75	5.00	22.50	Block	Right	Thermo	Z-s-t	Dual	Heinze	Hand
Old Reliable. 1	3,000	2,250	138	Solid	34x3	36x6	Under hood	4	3.75	5.00	22.50	Block	Left	Cent	Sq-t	Sing*	Bosch	Hand
Old Reliable. 2	4,000	2,750	120	Solid	34x4	36x4d	Under floor	4	4.25	5.00	29.00	Pairs	Opp	Cent	Sq-t	Sing*	Bosch	Hand
Old Reliable. 3	6,000	3,400	122	Solid	34x5	36x5d	Under floor	4	4.25	5.00	29.00	Pairs	Opp	Cent	Sq-t	Sing*	Bosch	Hand
Old Reliable. 4	8,000	4,000	126	Solid	36x5	36x5d	Under floor	4	4.75	5.50	36.15	Pairs	Opp	Cent	Sq-t	Sing*	Bosch	Hand
Old Reliable. 5	10,000	4,500	126	Solid	36x6	36x6d	Under floor	4	4.75	5.50	36.15	Pairs	Opp	Cent	Sq-t	Sing*	Bosch	Hand
Old Reliable. 7	14,000	5,000	126	Solid	36x6	40x7d	Under floor	4	4.75	6.75	36.15	Pairs	Left	Cent	Sq-t	Sing*	Bosch	Hand
Overland. 81	800	850-c*	106	Pneu	33x4	33x4	Under hood	4	4.00	4.50	25.60	Sing	Left	Thermo	Sq-t	Sing	Split	Hand
Packard. 2	4,000	2,800	120*	Solid	34x3	34x4d	Under hood	4	4.06	5.12	26.39	Pairs	Opp	Cent	Cell	Sing	Eisemann	Auto
Packard. 3	6,000	3,400	126*	Solid	36x4	36x5d	Under hood	4	4.50	5.50	32.40	Pairs	Opp	Cent	Cell	Sing	Eisemann	Auto
Packard. 4	8,000	3,550	126*	Solid	36x5	40x5d	Under hood	4	4.50									

ABBREVIATIONS: General, *, with other options; Opt, optional. Price, -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-st, solid in front, steel in rear; Pks, pneumatic in front, solid in rear; Pks pneumatic in front, cushion in rear; C&H, cushion in front, solid in rear. Tire Sizes, d, dual. Motor Location, Between seats, between seats. Cylinders Cast, Sing, singly or individually. Location of Valves, Opp, opposite, or T-head type; Top (2-cylinder motors only). L-head cylinder laid horizontal with valves up; R&H, at right and in head, L-head cylinder; L&H at left and in head, L-head cylinder; 2-cy, two-cylinder motor, no valves; Back, L-head motor placed transversely with valves at rear. Water Circulation, Cent, centrifugal pump; Gear, gear pump; Thermo, thermo-siphon circulation; Air, air-cooled, no water. Radiator Type, Finned, finned-tube; Cell, cellular or honeycomb; Sq-t, square-tube or flat-tube; Z-s-t, zig-zag-tube or crimped flat-tube. Ignition, Type, Sing, single; Doub, double; Dual-d, dual-double. Make of Magneto (or other sparking device), Split, Splitdorf; Conn, Connecticut; King, Kingston; West,

in Tabulated Form for Quick Comparison

MOTOR						TRANSMISSION						SPRINGS		CONTROL		Pre- pushion Taken By	Name and Model	
GOVERNOR		SPEEDS		Carbur- ator Make	Lubrica- tion	Clutch Type	GEARSET			Total Gear- Ratio in High	Final Drive	Torque Taken By	Front	Rear	Steer			Levers
Type	Drive	Meter in R.p.m.	Truck in M.p.h.				Type	Location	Speeds									
Cent...	Motor...	1,230	25	Opt.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	51-1	Bevel.....	T-arm.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Lippard-Stew... B*
Cent...	Motor...	1,230	25	Opt.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	6-1	Top worm	T-arm.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Lippard-Stew... BW*
Cent...	Motor...	1,134	18	Opt.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	61-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Lippard-Stew... F
Cent...	Motor...	1,300	18	Opt.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	71-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Lippard-Stew... H
Cent...	Motor...	1,295	15	Opt.....	Spl-press.	Cone.....	Selec.....	Amid.....	3	91-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Lippard-Stew... G
.....	.....	1,200	12	Holley	Ciro-spl.	Wet-d.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Little Giant... H
Ring	Motor...	900	10 1/2	Own	Spl-press.	Dry-d.....	Selec.....	Unit-j.....	4	101-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Locomobile... A2
Ring	Motor...	900	10 1/2	Own	Spl-press.	Dry-d.....	Selec.....	Unit-j.....	4	101-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Locomobile... AA2
.....	.....	.....	15	Strom	Ciro-spl.	Wet-d.....	Selec.....	Unit-j.....	3	12-1	Dbl chn-f.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	M&E..... B
.....	.....	.....	10	Strom	Ciro-spl.	Wet-d.....	Selec.....	Unit-m.....	3	14-1	Dbl chn-f.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	M&E..... G
Cent...	Motor...	1,000	14	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	71-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Maccar..... B
Cent...	Motor...	1,000	16	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Maccar..... E
Cent...	Motor...	1,000	12	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Maccar..... C
Cent...	Motor...	1,000	12	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	8-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Maccar..... F
Cent...	Motor...	1,000	14	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	8-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Maccar..... D
None	None	1,500	15	Scheb	Ciro-spl.	Cone.....	Selec.....	Amid.....	3	.....	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	McIntyre..... E
Suct.	Motor	1,500	12	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	.....	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	McIntyre..... A
Suct.	Motor	1,500	6	Strom	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	.....	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	McIntyre..... G
L-b.	Gearset.	1,150	15	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... C
L-b.	Gearset.	1,150	15	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... D
L-b.	Gearset.	1,150	15	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... E
L-b.	Gearset.	1,150	15	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... F
L-b.	Gearset.	1,250	12	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... G
L-b.	Gearset.	1,250	12	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... H
L-b.	Gearset.	1,250	12	Ray	Ciro-spl.	Exp-s.....	Prog.....	Unit-m.....	3	.....	Int-g.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Mais..... Tractor
None	None	.....	.....	Strom	Pressure	Dry-d.....	Selec.....	Unit-m.....	3	.....	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Martin..... R
None	None	.....	.....	Strom	Pressure	Wet-d.....	Selec.....	Unit-j.....	3	9-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Martin..... S
Cent.	Motor	1,000	13 1/2	Strom	Pressure	Wet-d.....	Selec.....	Unit-j.....	3	9-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Martin..... E
Cent.	Motor	1,000	13 1/2	Strom	Pressure	Wet-d.....	Selec.....	Unit-j.....	3	91-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Martin..... L
Cent.	Motor	1,400	20	Strom	Spl-press	Wet-d.....	Selec.....	Unit-m.....	3	51-1	Bevel.....	Tor-t.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Menominee... A3
Cent.	F-wheel	1,200	16	Strom	Spl-press	Dry-d.....	Selec.....	Unit-m.....	3	7-1	Doub-r.....	T-arm.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Menominee... B3
Cent.	F-wheel	1,400	14	Strom	Spl-press	Dry-p.....	Selec.....	Unit-m.....	3	.....	Doub-r.....	T-arm.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Menominee... C
.....	.....	1,000	15	Own	Spl-press	Wet-d.....	Plan.....	Unit-m.....	2	8-1	Dbl chn.....	.....	Ellip.....	Ellip.....	Right.....	Right.....	R-r.....	Mercury..... P
Cent.	Motor...	1,200	18	Scheb	Spl-press	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Modern..... L
Cent.	Motor...	1,200	16	Scheb	Spl-press	Cone.....	Selec.....	Unit-j.....	3	9-1	Dbl chn.....	Blank	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Modern..... H
Cent.	Motor...	1,200	16	Scheb	Spl-press	Dry-d.....	Selec.....	Unit-m.....	3	8-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Modern..... M
.....	.....	.....	.....	Strom	Ciro-spl.	Cone.....	Selec.....	Amid.....	3	7-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Moore..... B
Cent.	Motor	1,000	18.11	Scheb	Spl-press	Cone.....	Selec.....	Unit-j.....	3	61-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Moore..... 1 1/2
Cent.	Motor	1,000	17.4	Scheb	Spl-press	Cone.....	Selec.....	Unit-j.....	3	61-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Moore..... 2
Cent.	Motor	1,000	14	Scheb	Spl-press	Cone.....	Selec.....	Unit-j.....	3	61-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Moore..... 3
Cent.	Motor	1,000	12	Scheb	Spl-press	Cone.....	Selec.....	Unit-j.....	3	81-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Moore..... 4
Cent.	Motor	950	10	Scheb	Spl-press	Cone.....	Selec.....	Unit-j.....	4	91-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Moore..... 5
.....	.....	1,500	20	Master	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	6-1	Top worm	R-r.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Moreland..... 7X
.....	.....	1,500	18	Master	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm	R-r.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Moreland..... 1X
Cent.	Motor	1,100	15	Master	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Moreland..... 2X
Cent.	Motor	950	12	Master	Ciro-spl.	Dry-d.....	Selec.....	Amid.....	4	101-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Moreland..... 3X
Cent.	Motor	950	10	Master	Ciro-spl.	Dry-d.....	Selec.....	Unit-j.....	4	12-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Moreland..... 5X
Cent.	Motor	900	8	Master	Pressure	Cont-b.....	Selec.....	Unit-j.....	4	12-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Moreland..... 6X
.....	.....	1,400	28	.....	Splash	None.....	Fric.....	Amid.....	Any	.....	Sing chn.....	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Motokart..... 1&2
None	None	1,100	15	Zenith	Pressure	Cone.....	Selec.....	Unit-j.....	3	61-1	Dbl chn	.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Natco..... 20
Cent.	Motor	950	17	Ray	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Nelson&LeM... E1
Cent.	Motor	950	15	Ray	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Nelson&LeM... E1 1/2
Cent.	Motor	950	15	Ray	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	71-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Nelson&LeM... E2
Cent.	D-shft.	.....	15	Zenith	Ciro-spl.	Dry-d.....	Selec.....	Unit-m.....	3	71-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Netco..... C
Hyd	Motor...	1,000	18	Strom	Spl-press	Cone.....	Selec.....	Unit-j.....	3	31-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	New York..... L
.....	.....	.....	.....	Strom	Ciro-spl.	Cone.....	Selec.....	Unit-m.....	3	5-1	Bevel.....	R-r.....	1-Ell.....	Ellip.....	Left.....	Cent.....	R-r.....	O. K..... C&D
Cent.	Motor...	1,265	16	Holley	Spl-press	Cone.....	Selec.....	Unit-m.....	3	71-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Left.....	Left.....	Springs.....	Old Hickory... 30W
.....	.....	1,600	16	Carter	Spl-press	Dry-d.....	Selec.....	Unit-m.....	3	71-1	Top worm	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Old Reliable... 1 1/2
.....	.....	1,400	15	Strom	Spl-press	Wet-d.....	Selec.....	Unit-j.....	3	61-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Old Reliable... 2
.....	.....	1,400	14	Strom	Spl-press	Wet-d.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Old Reliable... 3
Cent.	D-shft.	1,400	14	Strom	Spl-press	Wet-d.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Old Reliable... 4
Cent.	D-shft.	1,400	12	Strom	Spl-press	Wet-d.....	Selec.....	Unit-j.....	3	81-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Old Reliable... 5
Cent.	D-shft.	1,000	10	Carter	Spl-press	Wet-d.....	Selec.....	Unit-j.....	3	81-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Old Reliable... 7
.....	.....	.....	.....	Scheb	Ciro-spl.	Cone.....	Selec.....	Unit-x.....	3	31-1	Bevel.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Tor-t.....	Overland..... 81
Cent.	Motor	1,000	14	Own	Splash	Dry-p.....	Prog.....	Unit-j.....	3	31-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Packard..... 2
Cent.	Motor	1,000	12	Own	Splash	Dry-p.....	Prog.....	Unit-j.....	3	11-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Packard..... 3
Cent.	Motor	1,000	12	Own	Splash	Dry-p.....	Prog.....	Unit-j.....	3	12-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Packard..... 4
Cent.	Motor	1,000	8 1/2	Own	Splash	Dry-p.....	Prog.....	Unit-j.....	3	111-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Packard..... 5
Cent.	Motor	1,000	8 1/2	Own	Splash	Dry-p.....	Prog.....	Unit-j.....	3	111-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Packard..... 6
.....	.....	1,400	20	Own	Fuel-inj.	Dry-d.....	Selec.....	Unit-j.....	3	61-1	Dbl chn.....	.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Palmer-Moore... D
.....	.....	1,500	25	Zephyr	Ciro-spl.	Cone.....	Selec.....	Unit-m.....	3	.....	Bevel.....	Tor-t.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Tor-t.....	Paulling..... O

Carburator Make, Strom, Stromberg; Scheb, Schebler; Ray, Rayfield; Exel, Ezcelior; King, Kingston; B-Z, Broese-Zephyr. Lubrication, Splash, non-circulating or simple splash; Giro-spl, circulating splash; Spl-press, splash-pressure; Fuel-in, fuel injection, oil mixed with fuel; Pressure, pressure feed, no splash. Clutch Type, Dry-p, dry plate; Dry-d, dry multiple disk; Wet-d, wet disk or disk-in-oil; R-cone, reversed cone or inverted cone; Exp-s, expanding shoe; Cont-b, contracting band. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear. Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, electric. Gearset Location, mid, amidships; Unit-m, unit with motor; Unit-j, unit with jackshaft; Unit-x, unit with axle; Unit-a, unit driveshaft. Final Drive, Bevel, direct bevel; Doub-r, double-reduction, bevel and spur; Int-g, internal gear; Top worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -1, to front wheels; -4, to all four wheels. Driving Torque, R-r, radius rods; T-arm, torque-arm; Tor-t, torsion tube; Sub-f, sub-frame. Springs, Ellip, elliptic; 1-Ell, half-elliptic; 1-Ell, quarter-elliptic; 1-Ell, three-quarters-elliptic; Plat, platform; T-all, transverse elliptic; Cant, cantilever; Comb, combination of half-elliptic and elliptic on double frames. Steering, Cent, center. Levers, Cent, center; C&r, gearshift center, brake right; C&l, gearshift center, brake left; St-cool, steering column. Propulsion R-r, radius rods; T-arm torque arm; Tor-t torsion tube; Sub-f, sub-frame.

Products of 377 Gasoline Truck Makers

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base in Inches	TIRES			Location	CYLINDERS				S.A.E. H.P.	MOTOR		COOLING		IGNITION		
				Kind	SIZES IN INCHES			No.	Bore in Ins.	Stroke in Ins.	Cylinders Cast		Valves Placed	Water Circulation	Radiator Type	Type	Make	Spark Advance	
					Front	Rear													
Paulding.....H	1,500	950	120	Solid....	36x24	36x3	Under hood..	4	3.50	5.00	19.61	Block	R&H	Thermo	Finned	Dual	Day-D	Hand	
Paulding.....G	2,000	1,300	120	Solid....	36x3	36x34	Under hood..	4	4.00	5.25	25.60	Block	R&H	Thermo	Finned	Dual	Day-D	Hand	
Paulding.....M	4,000	1,950	145	Solid....	36x4	36x4d	Under hood..	4	4.62	5.25	34.28	Block	R&H	Gear	Finned	Dual	Day-D	Hand	
Pearless.....3	6,000	3,700	151*	Solid....	36x5	40x5d	Under hood..	4	4.50	6.50	32.40	Pairs.	Opp.	Cent.	Finned	Dual	Bosch	Hand	
Pearless.....4	8,000	4,000	151*	Solid....	36x5	40x5d	Under hood..	4	4.50	6.50	32.40	Pairs.	Opp.	Cent.	Finned	Dual	Bosch	Hand	
Pearless.....5	10,000	4,500	151*	Solid....	36x6	42x6d	Under hood..	4	4.50	6.50	32.40	Pairs.	Opp.	Cent.	Finned	Dual	Bosch	Hand	
Pearless.....6	12,000	5,000	151*	Solid....	36x6	42x7d	Under hood..	4	4.50	6.50	32.40	Pairs.	Opp.	Cent.	Finned	Dual	Bosch	Hand	
Pierce-Arrow.....2	4,000	3,000	150*	Solid....	36x4	36x4d	Under hood..	4	4.00	5.50	25.60	Pairs.	Opp.	Cent.	Finned	Sing.	Bosch	Hand	
Pierce-Arrow.....5	10,000	4,500	168*	Solid....	36x5	40x6d	Under hood..	4	4.87	6.00	38.25	Pairs.	Opp.	Cent.	Finned	Dual	Bosch	Hand	
Ree.....J	4,000	1,650	130*	Solid....	36x4	36x3jd	Under hood..	4	4.12	4.50	27.20	Pairs.	R&H	Cent.	Finned	Dual	Nat'l	Hand	
Republic.....1500	1,500	.....	124	Solid*	35x3*	35x3*	Under hood..	4	3.50	5.00	19.61	Block	Right	Thermo	Finned	Sing.	Bosch	Fixed
Republic.....1	2,000	1,350	124	Solid....	35x3	35x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Eisemann	Fixed	
Republic.....1j	3,000	1,475	144	Solid....	35x3j	35x5*	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Eisemann	Fixed	
Roland.....1	2,000	2,000	120	Solid....	34x3j	36x4	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent.	Finned	Sing.	Eisemann	Fixed	
Roland.....3	6,000	3,500	144	Solid....	36x5	36x5d	Under hood..	4	4.25	6.75	29.00	Pairs.	Right	Cent.	Finned	Dual	Eisemann	Auto	
Roland.....3j	7,000	3,500	156	Solid....	36x5	40x5d	Under hood..	4	4.50	6.75	32.40	Pairs.	Right	Cent.	Finned	Dual	Eisemann	Auto	
Rowe.....CW	3,000	2,450	144	Solid....	34x3j	36x3d	Under hood..	4	4.00	5.00	25.60	Block	.....	Thermo	Sq-t	Dual	Bosch	Hand
Rowe.....DW	4,000	2,800	150	Solid....	36x4	36x4d	Under hood..	4	4.25	5.00	29.00	Pairs.	.....	Cent.	Sq-t	Dual	Bosch	Hand
Rowe.....EW	6,000	3,400	156	Solid....	36x5	40x5d	Under hood..	4	4.00	5.50	25.60	Pairs.	.....	Cent.	Sq-t	Dual	Bosch	Hand
Rowe.....GW	10,000	4,500	171	Solid....	36x6	40x6d	Under hood..	4	4.75	5.50	36.15	Pairs.	.....	Cent.	Sq-t	Dual	Bosch	Hand
Royal.....B3j	7,000	3,400	132	Solid....	36x5	40x5d	Under floor..	4	4.75	5.50	36.15	Pairs.	Opp.	Cent.	Cell	Dual	Bosch	Fixed	
Royal.....A5	10,000	4,500	138	Solid....	36x6	40x6d	Under floor..	4	4.75	5.50	36.15	Pairs.	Opp.	Cent.	Cell	Dual	Bosch	Fixed	
Sandow.....1j	3,000	1,900	125*	Solid....	36x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	L&H	Gear	Cell	Sing.	Bosch	2-pt	
Sandow.....2	4,000	2,250	125*	Solid....	36x4	36x4d	Under hood..	4	4.12	5.25	27.20	Block	L&H	Gear	Cell	Sing.	Bosch	2-pt	
Sandow.....3	6,000	3,000	147*	Solid....	36x5	36x5d	Under hood..	4	4.50	5.50	32.40	Pairs.	L&H	Gear	Cell	Dual	Bosch	2-pt	
Sanford.....O	1,500	1,290	120	Solid*	36x3*	36x3*	Under hood..	4	3.50	5.12	19.61	Block	Right	Thermo	Finned	Sing.	Split	Fixed	
Sanford.....K	3,000	1,660	106	Solid.....	36x3j	36x3j	Under floor..	4	4.00	4.50	25.60	Pairs.	Left	Cent.	Sq-t	Dual	Bosch	Hand	
Sanford.....L	4,000	1,910	118	Solid.....	36x3j	36x4	Under floor..	4	4.12	5.00	27.20	Pairs.	Left	Cent.	Sq-t	Dual	Bosch	Hand	
Sanford.....M	4,000	1,910	140	Solid.....	36x3j	36x5	Under hood..	4	4.12	5.00	27.20	Pairs.	Left	Cent.	Finned	Dual	Bosch	Hand	
Saxon.....A2	400	395-c	96	Pneu....	28x3	28x3	Under hood..	4	2.62	4.00	11.23	Block	Left	Thermo	Cell	Sing.	Atw-K	Auto	
Selden.....JB	3,000	2,000	150	Solid....	36x3j	36x5	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Bosch	Fixed	
Service.....W	2,000	2,000	135*	Solid....	36x3j	36x5	Under hood..	4	3.75	5.50	22.50	Block	Right	Cent.	Finned	Sing.	Eisemann	Fixed	
Service.....Q	3,000	1,975	150	Solid....	36x3j	36x5	Under hood..	4	4.12	5.50	27.20	Block	Right	Cent.	Cell	Sing.	Eisemann	Hand	
Service.....P	4,000	2,375	150	Solid....	36x4	40x3jd	Under hood..	4	4.12	5.50	27.20	Block	Right	Cent.	Cell	Sing.	Eisemann	Hand	
Service.....PW	4,000	2,500	160	Solid....	36x4	36x4d	Under hood..	4	4.12	5.50	27.20	Block	Right	Cent.	Cell	Sing.	Eisemann	Hand	
Service.....H	6,000	2,975	171	Solid....	36x5	40x5d	Under hood..	4	4.25	5.50	29.00	Block	Right	Cent.	Cell	Sing.	Eisemann	Hand	
Service.....HX	10,000	4,000	175*	Solid....	36x6	40x6d	Under hood..	4	4.75	6.75	36.15	Block	Right	Cent.	Cell	Dual	Eisemann	Hand	
Signal.....D	2,000	1,400	120	Solid....	34x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Eisemann	Fixed	
Signal.....DL	2,000	1,450	144	Solid....	34x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Eisemann	Fixed	
Signal.....F	2,000	1,500	120	Solid....	34x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Eisemann	Fixed	
Signal.....FL	2,000	1,550	144	Solid....	34x3	36x4	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Finned	Sing.	Eisemann	Fixed	
Smith.....A	7,000	3,750	168	Solid....	36x5	36x5d	Under hood..	4	5.00	5.75	40.00	Pairs.	Opp.	Cent.	Finned	Doub	Eisemann	Hand	
Smith.....C	12,000	4,750	168	Solid....	36x6	40x6d	Under hood..	4	5.25	5.75	44.20	Pairs.	Opp.	Cent.	Finned	Doub	Eisemann	Hand	
South Bend.....40	4,000	2,000	136*	Pneu*...	36x4j*	36x4j*	Under hood..	4	4.00	5.00	25.60	Pairs.	Opp.	Cent.	Sq-t	Dual	Bosch	Hand	
South Bend.....80	8,000	3,000	152	Pneu*...	39x6*	39x6*	Under hood..	4	5.25	7.00	44.20	Pairs.	Opp.	Cent.	Sq-t	Dual*	Bosch*	Hand	
Speedwell.....8Y	4,000	2,850	115	Solid....	36x4	36x3jd	Under floor..	4	4.12	5.25	27.20	Block	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Speedwell.....10Z	8,000	3,750	115	Solid....	36x5	36x5d	Under floor..	4	5.00	5.00	40.00	Pairs.	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Speedwell.....8X	12,000	4,400	139	Solid....	36x6	36x6d	Under floor..	4	5.00	5.00	40.00	Pairs.	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Standard-D.....3	6,000	2,750	144	Solid....	36x5	36x5d	Under hood..	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Cell	Sing.	Eisemann	Fixed	
Standard-D.....7	14,000	3,300	112	Solid....	40x6	40x6d	Under hood..	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Cell	Sing.	Eisemann	Fixed	
Standard-O.....DX	1,500	1,700	.....	Pneu....	34x4j	34x4j	Under hood..	4	4.00	4.50	25.60	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Hand
Standard-O.....A	2,000	1,700	134	Solid*	36x4*	36x4	Under hood..	4	4.00	4.50	25.60	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Fixed	
Standard-O.....AX	2,000	1,900	124*	Solid*	36x4*	36x4	Under hood..	4	4.00	4.50	25.60	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Hand	
Standard-O.....B	3,000	1,800	134*	Solid*	37x4j*	36x4j	Under hood..	4	4.00	4.50	25.60	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Fixed	
Standard-O.....BX	3,000	2,100	134*	Solid*	37x4j*	36x5	Under hood..	4	4.00	4.50	25.60	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Fixed	
Standard-O.....C	4,000	2,000	144*	Solid*	37x5*	36x5*	Under hood..	4	4.00	4.50	25.60	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Fixed	
Standard-O.....CX	7,000	3,200	162	Solid....	36x5	36x5d	Under hood..	4	4.37	6.00	30.65	Pairs.	Right	Cent.	Z-s-t	Sing.	Eisemann	Hand	
Stegman.....	1,500	1,600	125	Pneu....	34x4j	34x4j	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Stegman.....	3,000	2,100	150	C&S.....	34x3j	36x5	Under hood..	4	3.75	5.25	22.50	Block	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Stegman.....	5,000	2,800	142*	Solid....	34x3j	36x3jdb	Under hood..	4	4.25	5.25	29.00	Block	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Stegman.....	7,000	3,350	155*	Solid....	36x4	40x4db	Under hood..	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Stegman.....	10,000	4,200	168	Solid....	36x6	40x6db	Under hood..	4	4.50	6.75	32.40	Pairs.	Left	Cent.	Sq-t	Sing.	Eisemann	Auto	
Sternberg.....	1,000	850-c	88	Pneu....	30x4	30x4	Under hood..	4	2.75	4.00	12.08	Block	Right	Thermo	Sq-t	Sing.	Eisemann	Hand	
Sternberg.....	4,000	2,800	148*	Solid....	36x5	36x3jd*	Under hood..	4	3.75	5.75	22.50	Pairs.	Right	Cent.	Cell	Sing.	Eisemann	Auto	
Sternberg.....	6,000	3,400	158*	Solid....	36x6	36x4d*	Under hood..	4	4.25	5.75	29.00	Pairs.	Right	Cent.	Cell	Sing.	Eisemann	Auto</	

in Tabulated Form for Quick Comparison

MOTOR						TRANSMISSION						SPRINGS		CONTROL		Pro- pulsion Taken By	Name and Mode	
GOVERNOR		SPEEDS		Carbur- eter Make	Lubrica- tion	Clutch Type	GEARSET			Total Gear- Ratio in High	Final Drive	Torque Taken By	Front	Rear	Steer			Levers
Type	Drive	Motor in R.p.m.	Truck in M.p.h.				Type	Location	Speeds									
		1,800	30	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Unit-m.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Paulding.....H
				Scheb.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3		Dbl chn.....		1-Ell.....	Plat.....	Right.....	Cent.....	R-r.....	Paulding.....G
				Scheb.....	Circ-spl.....	Dry-d.....	Selec.....		3		Dbl chn.....		1-Ell.....	Plat.....	Right.....	Cent.....	R-r.....	Paulding.....M
Cent.....	Motor...	925	141	Peerless.....	Splash.....	Cone.....	Selec.....	Amid.....	4	71-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Peerless.....3
Cent.....	Motor...	925	121	Peerless.....	Splash.....	Cone.....	Selec.....	Amid.....	4	81-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Peerless.....4
Cent.....	Motor...	925	101	Peerless.....	Splash.....	Cone.....	Selec.....	Amid.....	4	101-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Peerless.....5
Cent.....	Motor...	925	10	Peerless.....	Splash.....	Cone.....	Selec.....	Amid.....	4	101-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Peerless.....
Cent.....	Motor...	1,050	16	Own.....	Pressure.....	Cone.....	Selec.....	Amid.....	3		Top worm.....	T-arm.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Pierce-Arrow.....2
Cent.....	Motor...	950	14	Own.....	Pressure.....	Cone.....	Selec.....	Amid.....	3		Top worm.....	T-arm.....	1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Pierce-Arrow.....5
Hyd.....	Motor...	1,200	12	Holley.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	81-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Reo.....J
Suet.....	Motor...	1,050	18	Strom.....	Spl-press.....	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Int-g.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Republic.....1500
Suet.....	Motor...	1,000	15	Strom.....	Spl-press.....	Dry-d.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Republic.....1
Suet.....	Motor...	1,000	15	Strom.....	Spl-press.....	Cone.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Republic.....11
None.....	None.....	1,500	18	G&A.....	Circ-spl.....	None.....	Elec.....	Amid.....	2		Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Roland.....1
Cent.....	Motor...	900	12	G&A.....	Circ-spl.....	None.....	Elec.....	Amid.....	2		Top worm.....	Springs.....	Ellip.....	Ellip.....	Left.....	Left.....	Springs.....	Roland.....3
Cent.....	Motor...	900	12	G&A.....	Circ-spl.....	None.....	Elec.....	Amid.....	2		Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Left.....	R-r.....	Roland.....31
	Motor.....			Ray.....	Pressure.....	Dry-d.....	Selec.....		3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	R&C.....		Rowe.....CW
	Motor.....			Ray.....	Pressure.....	Dry-d.....	Selec.....		3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	R&C.....		Rowe.....DW
	Motor.....			Ray.....	Pressure.....	Dry-d.....	Selec.....		3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	R&C.....		Rowe.....EW
	Motor.....			Ray.....	Pressure.....	Wet-d.....			3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	R&C.....		Rowe.....GW
L-b.....	Motor...	900	15	Strom.....	Pressure.....	Wet-d.....	Ind-c.....	Unit-j.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Royal.....B31
L-b.....	Motor...	900	12	Strom.....	Pressure.....	Wet-d.....	Ind-c.....	Unit-j.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Royal.....A5
Cent.....	Motor...			Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Sandow.....11
Cent.....	Motor...			Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Sandow.....2
Cent.....	Motor...			Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Cent.....	R-r.....	Sandow.....3
		1,100	18	Muir.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	7-1	Int-g.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Sanford.....O
Cent.....		1,100	16	Scheb.....	Circ-spl.....	Wet-d.....	Selec.....	Unit-m.....	3	7-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Sanford.....K
Cent.....	Motor...	1,100	14	Scheb.....	Circ-spl.....	Wet-d.....	Selec.....	Unit-m.....	3	7-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Sanford.....L
Cent.....	Motor...	1,100	14	Scheb.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	7-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Sanford.....M
		1,600	40	Mayer.....	Splash.....	Dry-p.....	Prog.....	Unit-x.....	2	41-1	Bevel.....	Tor-t.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Tor-t.....	Saxon.....A2
Cent*.....	Motor...	1,150	16	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	71-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Selden.....JB
Cent*.....	Motor...	1,000	16	Strom.....	Spl-press.....	Cone.....	Selec.....	Amid.....	3	61-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Service.....W
Cent*.....	Motor...	1,000	14	Strom.....	Spl-press.....	Cone.....	Selec.....	Unit-j.....	3	8-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Service.....Q
Cent*.....	Motor...	1,000	12	Strom.....	Spl-press.....	Cone.....	Selec.....	Unit-j.....	3	9-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Service.....P
Cent*.....	Motor...	1,000	14	Strom.....	Pressure.....	Cone.....	Selec.....	Amid.....	3	71-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Service.....PW
Cent*.....	Motor...	1,000	11	Strom.....	Spl-press.....	Cone.....	Selec.....	Unit-j.....	3	81-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Service.....H
Cent.....	Motor...	870	12	Strom.....	Spl-press.....	Cone.....	Selec.....	Unit-j.....	4	61-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Service.....HX
Suet.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Signal.....D
Suet.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Signal.....DL
Suet.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Signal.....F
Suet.....	Motor...	1,200	15	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	61-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Signal.....FL
Suet.....	Motor...	900	12	Strom.....	Circ-spl.....	Dry-d.....	Ind-c.....	Unit-s.....	3	81-1	Top worm.....	Tor-t.....	1-Ell.....	1-Ell.....	Right.....	Right.....	Tor-t.....	Smith.....A
Suet.....	Motor...	1,000	9	Strom.....	Circ-spl.....	Dry-d.....	Ind-c.....	Unit-s.....	3	81-1	Top worm.....	Tor-t.....	1-Ell.....	1-Ell.....	Right.....	Right.....	Tor-t.....	Smith.....C
Suet.....	F-wheel.....	1,800	25	Strom.....	Spl-press.....	Wet-d.....	Selec.....	Unit-j.....	3	4-1	Dbl chn.....		1-Ell.....	1-Ell.....	Opt.....	Opt.....	R-r.....	South Bend.....40
Suet.....	F-wheel.....	1,400	30	Strom.....	Spl-press.....	Wet-d.....	Selec.....	Unit-j.....	3*	4-1	Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	R&C.....	R-r.....	South Bend.....80
Cent.....	Motor...	1,100	15	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	3	91-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Speedwell.....8Y
Cent.....	Motor...	1,200	12	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	3	101-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Speedwell.....10Z
Cent.....	Motor...	1,200	10	Scheb.....	Circ-spl.....	Cone.....	Selec.....	Amid.....	3	101-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Speedwell.....8X
Suet.....	Motor...	1,200	12	Strom.....	Circ-spl.....	Dry-d.....	Prog.....	Unit-m.....	3	9-1	T-worm*.....	T-arm*.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs*.....	Standard-D.....3
Suet.....	Motor...	1,200	10	Strom.....	Circ-spl.....	Dry-d.....	Prog.....	Unit-m.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Standard-D.....7
L-b.....	Motor...			Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	51-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Standard-O.....DX
L-b.....	Motor...	1,250	18	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Standard-O.....A
L-b.....	Motor...	1,250	18	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	61-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Standard-O.....AX
L-b.....	Motor...	1,250	18	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Standard-O.....B
L-b.....	Motor...	1,250	18	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	71-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Standard-O.....BX
L-b.....	Motor...	1,250	18	Strom.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Standard-O.....C
L-b.....	Motor...	1,000	14	Scheb.....	Circ-spl.....	Dry-d.....	Selec.....	Amid.....	3	81-1	Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Right.....	Cent.....	Springs.....	Standard-O.....CX
Cent.....	Motor...	1,100	20	Carter.....	Spl-press.....	Dry-d.....	Selec.....	Unit-m.....	3	6-1	Bevel.....	R-r.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Stegeman.....
Cent.....	Motor...	1,100	18	Carter.....	Spl-press.....	Dry-d.....	Selec.....	Unit-m.....	3	8-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Stegeman.....
Cent.....	Motor...	1,100	15	Carter.....	Spl-press.....	Dry-d.....	Selec.....	Unit-m.....	3	81-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Stegeman.....
Cent.....	Motor...	1,100	12	Carter.....	Spl-press.....	Dry-d.....	Selec.....	Unit-m.....	3	111-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Stegeman.....
Cent.....	Motor...	1,100	10	Carter.....	Spl-press.....	Dry-d.....	Selec.....	Unit-m.....	3	141-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Stegeman.....
None.....	None.....	1,500	19		Spl-press.....	Cone.....	Selec.....	Unit-m.....	3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Sternberg.....
Cent.....	Motor...	1,020	14	Holley.....	Circ-spl.....	Dry-p.....	Ind-c.....	Unit-m.....	3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Sternberg.....
Cent.....	Motor...	1,020	13	Holley.....	Circ-spl.....	Dry-p.....	Ind-c.....	Unit-m.....	3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Sternberg.....
Cent.....	Motor...	1,000	11	Holley.....	Circ-spl.....	Dry-p.....	Ind-c.....	Unit-m.....	3		Top worm.....	Springs.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Sternberg.....
Cent.....	Motor...	950	10	Holley.....	Circ-spl.....	Wet-d.....	Ind-c.....	Amid.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Sternberg.....
Cent.....	Motor...	950	10	Holley.....	Circ-spl.....	Wet-d.....	Ind-c.....	Amid.....	3		Dbl chn.....		1-Ell.....	1-Ell.....	Right.....	Right.....	R-r.....	Sternberg.....
Cent.....	Motor...		30	Zenith.....	Circ-spl.....	Dry-d.....	Selec.....	Unit-m.....	3	51-1	Bevel.....	T-arm.....	1-Ell.....	1-Ell.....	Left.....	Cent.....	Springs.....	Stewart-B.....
		600	18	Scheb.....	Spl-press.....	Wet-d.....	Plan.....	Unit-m.....	2		Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Stewart-K.....C
			20	Seheb.....	Circ-spl.....	Cone.....	Selec.....	Unit-x.....	3	41-1	Bevel.....	T-arm.....	1-Ell.....	Ellip.....	Left*	Cent*	R-r.....	Studebaker.....5
Cent.....	Motor...	1,350	18	Holley.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3	71-1	Dbl chn.....		1-Ell.....	Plat.....	Left.....	Cent.....	R-r.....	Sullivan.....G
None.....	None.....			Breeze.....	Circ-spl.....	Cone.....	Selec.....	Unit-j.....	3	61-1	Dbl chn.....		1-Ell.....	1-Ell.....	Left.....	Cent.....	R-r.....	Tiffin.....A

CARBURETOR: Make, Strom, Stromberg; Scheib, Scheller; Ray, Rayfield; Excel, Ezeclior; King, Kingston; B-Z, Broeze-Zephyr. Lubrication, Splash, non-circulating or simple splash; Circ-apl, circulating splash; Sp-press, splash-pressure; Fuel-inj, fuel injection; Oil, mixed with fuel; Pressure, pressure feed, no splash. Clutch Type, Dry-d, dry multiple disk; Wet-d, wet disk or dist-in-R-cone clutch; S-p, semi-positive clutch; Ex-hd, external exhaust; Gear-shifting, T-type, cone, progressive shifting gear; S-sliding, sliding gate; Ind-a, individual planetary; Ind-a, constant-mesh individual-clutch; Frn, friction; Hyd, hydraulic; Elec, electric. Gearset Location, Amid, amidships; Unit-, unit motor; Unit-, unit with jackshaft; Unit-u, unit with axle; Unit-u, unit drivehaft. Final Drive, Bevel, direct belt; Doub-r, double-reduction, bevel and spur; Int-g, internal gear; Top worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; -f, to front wheels; -a, to both wheels; -t, to all four wheels. Driving Torque R-r, radius rods T-arm, torque arm; Tor-t, torsion tube; Sub-f, sub-frame. Springs, Ellip, elliptic; E-ell, half-elliptic; E-ell, quarter-elliptic; E-ell, three-quarters-elliptic; Plat, platform; T-ell, transverse elliptic; Cant, cantilever; Comb, combination of half-elliptic and elliptic; on double frames. Steering Center, Lovers, Cent, center; C&F, gearshift center, brake right; C&L, gearshift center brake left; St-co, steering column. Propulsion, R-r, radius rods; I-arm, torque arm; Toe-t, torsion tube; Sub-f, sub-frame.

Products of 377 Gasoline Truck Makers

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base in inches	TIRES			Location	MOTOR										IGNITION		
				Kind	SIZES IN INCHES			CYLINDERS			S.A.E. H.P.	Cylinders Cast	Valves Placed	COOLING		IGNITION				
					Front	Rear		No.	Bore in Ins.	Stroke in Ins.				Water Circulation	Radiator Type	Type	Make	Spark Advance		
Tiffin.....G	2,000	2,000	128	Solid....	36x3½	36x4	Under hood..	4	3.75	4.25	22.50	Block	Left	Cent.....	Finned	Sing.	Bosch.....	Hand		
Tiffin.....M	4,000	2,700	140	Solid....	36x4	36x3½d	Under hood..	4	4.12	5.25	27.20	Block	Left	Cent.....	Finned	Sing.	Bosch.....	Hand		
Trabold.....T	2,000	1,250	118	Solid....	36x3	38x3½	Under hood..	4	3.50	5.00	19.61	Block	Right	Cent.....	Cell.....	Dual	Briggs.....	Hand		
Trabold.....	4,000	2,450	130	Solid....	36x4	38x3d	Under hood..	4	4.12	5.50	27.20	Block	Right	Cent.....	Cell.....	Dual	West.....	Hand		
Trabold.....	6,000	3,300	130	Solid....	36x4	38x4d	Under hood..	4	4.25	5.50	29.00	Block	Right	Cent.....	Cell.....	Dual	West.....	Hand		
Trumbull.....15D	500	395-c	80	Pneu....	28x3	28x3	Under hood..	4	2.87	4.00	13.37	Block	Right	Thermo...	Finned	Sing.....	Split.....	Fixed		
Universal.....C	3,000	1,950	132	Solid....	34x3½	34x5	Under hood..	4	3.75	5.25	22.50	Block	Right	Thermo...	Finned	Sing.....	Eisemann...	Hand		
Universal.....A	6,000	3,400	132	Solid....	36x5	36x4d	Under floor..	4	4.00	5.50	25.60	Pairs...	Opp.	Cent.....	Cell.....	Dual	Eisemann...	Hand		
U. S.....E	4,000	2,550	132	Solid....	34x3½	36x3½d	Under hood..	4	4.12	5.25	27.20	Block	Left	Cent.....	Sq-t	Dual	Bosch.....	Hand		
U. S.....G	5,000	2,750	138	Solid....	34x4	36x4d	Under hood..	4	4.12	5.25	27.20	Block	Left	Cent.....	Sq-t	Dual	Bosch.....	Hand		
U. S.....D	6,000	3,200	144	Solid....	34x5	36x5d	Under hood..	4	4.50	5.50	32.40	Pairs...	Left	Cent.....	Sq-t	Dual	Bosch.....	Hand		
U. S.....F	8,000	3,550	156	Solid....	34x5	36x5d	Under hood..	4	4.50	5.50	32.40	Pairs...	Left	Cent.....	Sq-t	Dual	Bosch.....	Hand		
Valie.....X	2,000	2,000	129*	Solid*...	36x3½*	36x4	Under hood..	4	4.62	5.25	34.28	Pairs...	Left	Cent.....	Cell.....	Dual	Bosch.....	Fixed		
Valie.....U	3,000	2,250	140	Solid....	36x4	36x5*	Under hood..	4	4.62	5.25	34.28	Pairs...	Left	Cent.....	Sq-t	Dual	Bosch.....	Fixed		
Valie.....	5,000	2,850	148*	Solid....	36x4	36x4d	Under hood..	4	4.50	5.50	32.40	Pairs...	Left	Cent.....	Sq-t	Dual	Bosch.....	Fixed		
Valie.....Z	8,000	3,350	148*	Solid....	36x5	40x5d	Under hood..	4	4.50	5.50	32.40	Pairs...	Left	Cent.....	Cell.....	Dual	Bosch.....	Fixed		
Valie.....ZS	10,000	3,750	148*	Solid....	36x6	40x6d	Under hood..	4	4.50	5.50	32.40	Pairs...	Left	Cent.....	Cell.....	Dual	Bosch.....	Fixed		
Vim.....L&F	1,000	620	94	Pneu....	30x3½	30x3½	Under hood..	4	3.00	4.50	14.40	Block	Right	Thermo...	Finned	Sing.....	Atw-K.....	Hand		
Vulcan.....2	5,000	2,750	150*	Solid....	36x4	30x3½d	Under hood..	4	4.33	5.50	29.99	Pairs...	Left	Thermo...	Cell.....	Dual-d	Bosch.....	Hand		
Vulcan.....3	7,500	3,250	156*	Solid....	36x5	34x4d	Under hood..	4	4.33	5.50	29.99	Pairs...	Left	Thermo...	Cell.....	Dual-d	Bosch.....	Hand		
Vulcan.....4	9,200	4,000	162	Solid....	35x5	35x5d	Under hood..	4	4.33	5.50	29.99	Pairs...	Left	Thermo...	Cell.....	Dual-d	Bosch.....	Hand		
Vulcan.....5	11,500	4,500	162	Solid....	36x6	36x6d	Under hood..	4	4.33	5.50	29.99	Pairs...	Left	Thermo...	Cell.....	Dual-d	Bosch.....	Hand		
Vulcan.....7	15,500	6,000	156*	Solid....	36x7	42x7d	Under hood..	4	4.75	5.50	36.15	Pairs...	Left	Gear.....	Cell.....	Dual-d	Bosch.....	Hand		
Wagenhals.....	800	690-c	80	P&C....	30x3	34x4½	Under hood..	4	3.50	3.37	19.61	Pairs...	Back	Gear.....	Finned	Dual.....		Hand		
Walter.....5	10,000	4,500	144	Solid....	40x6	40x5d	Under hood..	4	4.37	6.00	30.65	Block	Right	Cent.....	Finned	Dual	Eisemann...	Auto		
Walter.....6	12,000	4,750	144	Solid....	40x6	40x5d	Under hood..	4	4.37	6.00	30.65	Block	Right	Cent.....	Finned	Dual	Eisemann...	Auto		
Walter.....7½	15,000	5,000	144	Solid....	40x6	40x6d	Under hood..	4	4.37	6.00	30.65	Block	Right	Cent.....	Finned	Dual	Eisemann...	Auto		
Walter.....Tractor	24,000	4,500	108	Solid....	40x4d	40x4d	Under hood..	4	4.37	6.00	30.65	Block	Right	Cent.....	Finned	Dual	Eisemann...	Auto		
Ware.....	6,000			Solid....			Under hood..	4	4.00	5.50	25.60	Pairs...		Gear.....			Mea.....			
White.....GBBE	1,500	2,100	133½	Pneu....	34x4½	34x4½	Under hood..	4	3.75	5.12	22.50	Block	Right	Cent.....	Cell.....	Sing.	Bosch.....	Hand		
White.....TBC	3,000	3,000	145½	Pneu....	36x4½	36x4½d	Under hood..	4	3.75	5.12	22.50	Block	Right	Cent.....	Cell.....	Sing.	Bosch.....	Hand		
White.....TAD	6,000	3,700	163	Solid....	36x5	40x5d	Under hood..	4	3.75	5.12	22.50	Block	Left	Cent.....	Cell.....	Sing.	Bosch.....	Hand		
White.....TCD	10,000	4,500	165	Solid....	36x5	40x6d	Under hood..	4	4.25	6.37	29.00	Block	Left	Cent.....	Cell.....	Sing.	Bosch.....	Hand		
Wichita.....A	2,000	1,650	110	Solid....	34x3	34x4	Under hood..	4	3.25	5.00	16.92	Block	L&H	Thermo...	Cell.....	Sing.	Bosch*	Hand		
Wichita.....B	4,000	2,100	118	Solid....	34x3½	34x3d	Under hood..	4	3.50	5.00	19.61	Block	L&H	Thermo...	Cell.....	Sing.	Bosch*	Hand		
Wichita.....H	7,000	3,250	165	Solid....	36x5	36x5d	Under hood..	4	4.25*	6.75	29.00*	Pairs...	L&H	Cent.....	Cell.....	Dual	Bosch.....	Hand		
Wilcox.....T	1,000	1,000	115	Pneu....	33x4	33x4	Under hood..	4	3.50	5.00	19.61	Block		Thermo...	Z-z-t	Sing.	Mea.....	Hand		
Wilcox.....LA	2,000	2,000	132	Solid*...	36x3½*	36x5d*	Under hood..	4	4.12	5.25	27.20	Block	Right	Cent.....	Z-z-t	Sing.	Mea.....	Hand		
Wilcox.....NA	4,000	2,500	118	Solid....	36x4	36x3½d	Under floor..	4	4.25	5.00	29.00	Pairs...		Cent.....	Z-z-t	Dual	Bosch.....	Hand		
Wilcox.....JA	6,000	3,250	128	Solid....	36x5	36x4d	Under floor..	4	4.25	5.00	29.00	Pairs...		Cent.....	Z-z-t	Dual	Bosch.....	Hand		
Willot.....M	1,500	1,600	125	Pneu....	34x4½	34x4½	Under hood..	4	3.75	5.25	22.50	Block	Right	Cent.....	Finned	Sing.	Eisemann...	Auto		
Willot.....L	4,000	2,600	144	Solid....	36x4	36x4db	Under hood..	4	4.12	5.25	27.20	Block	Right	Cent.....	Finned	Sing.	Eisemann...	Auto		
Willot.....K	6,000	2,800	144*	Solid....	36x4	36x4db	Under hood..	4	4.50	5.25	32.40	Pairs...	Left	Cent.....	Finned	Sing.	Eisemann...	Auto		
Wilson.....B	4,000	1,800	130*	Solid....	37x3½	37x5	Under hood..	4	4.12	5.25	27.20	Block	Right	Cent.....	Finned	Sing.	Eisemann...	Fixed		
Willys.....65	1,500	1,350	120	P&S....	34x4½	36x3½	Under hood..	4	4.12	4.50	27.20	Sing.	Left	Thermo...	Finned	Dual.....	Split.....	Hand		

Received Too Late to Classify

Handy Wagon, Jr.	500	390	65	Solid	34x1½	34x1½	Under body	2	3.75	3.75	11.25	Sing.	R&H	Air		Sing.	None	Hand
Handy Wagon	800	497.50	77	Solid	34x1½	34x1½	Under body	2	4.12	3.75	13.60	Sing.	R&H	Air		Sing.	None	Hand
Handy Wagon, Sr.	1,200	600	86	Solid	34x1½	34x2	Under body	2	4.75	4.75	18.10	Sing.	R&H	Air		Sing.	Briggs	Hand
Hurlburt	1	2,000	1,500	120	Pneu.	34x4½	Under hood	4	3.75	4.50	22.50	Block	Right	Cent.	Finned	Dual	Eisemann	Auto
Hurlburt	2	4,000	3,000	Opt	Solid	36x4	Under hood	4	4.12	5.50	27.20	Block	Right	Cent.	Finned	Dual	Eisemann	Auto
Hurlburt	3½	7,000	3,500	Opt	Solid	36x5	Under hood	4	4.25	5.50	29.00	Block	Right	Cent.	Finned	Dual	Eisemann	Auto
Locomobile	3	6,000	3,500	150*	Solid	36x5	Under hood	4	4.25	6.00	29.00	Pairs.	Opp.	Cent.	Cell.	Dual	Eisemann	Hand
Locomobile	4	8,000	3,600	150*	Solid	36x5	Under hood	4	4.25	6.00	29.00	Pairs.	Opp.	Cent.	Cell.	Dual	Eisemann	Hand
C. T.	Tractor	10,000	4,750	155	Solid	36x4d	Under seats	4	4.00	6.00	25.60	Sing.	R&H	Cent.	Sq-t.	Sing.	Mea	2-pt.
Transit	E	2,000	2,000	120*	Solid	36x4	Betw. seats*	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Sq-t.	Sing.	Mea	Hand
Transit	F	4,000	2,850	144	Solid	36x4	Betw. seats*	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Sq-t.	Sing.	Mea	Hand
Transit	T	7,000	3,500	144	Solid	36x5	Betw. seats*	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Sq-t.	Sing.	Mea	Hand
Transit	V	10,000	4,500	144*	Solid	36x6	Betw. seats*	4	4.50	5.50	32.40	Pairs.	Left	Cent.	Sq-t.	Sing.	Mea	Hand
Dispatch	L	1,200	900	120	Pneu.	36x3½	Under hood	4	3.75	5.00	22.50	Block	Left	Thermo.	Cell.	Dual	Bosch	Hand
Morton	1½	3,000			Solid	34x4	Under seat	4	3.75	5.25	22.50	Pairs.	Opp.		Cell.	Dual	Bosch	Hand
Morton	2	4,000		140	Solid	36x5		4	4.50	5.50	30.65	Pairs.		Cent.	Cell.	Dual	Bosch	Hand
Morton	2½	5,000		140	Solid	36x5		4	4.50	5.50	30.65	Pairs.		Cent.	Cell.	Dual	Bosch	Hand
Morton	3	6,000		112	Solid			4	4.75	6.75								
Morton	3½	7,000			Solid	38x6	40x6d	4	5.00	5.75	40.00	Pairs.	Opp.		Cell.	Dual	Bosch	Hand
Morton	5	10,000			Solid	38x7	42x7d	4	5.25	5.75	42.20	Pairs.	Opp.		Cell.	Dual	Bosch	Hand
Morton	6	12,000		140	Solid			4	5.50	7.00					Cell.	Dual	Bosch	Hand
Morton	Tractor	20,000		108	Solid	40x6	40x6db	4	5.50	7.00	48.48	Sing.			Cell.	Dual	Split	Hand

ABBREVIATIONS: General, * with other options; Opt, optional. Price, -c, complete with body. Tires, Kind, Pneu, pneumatic; Sol-et, solid in front, steel in rear; P&S, pneumatic in front, solid in rear; P&C, pneumatic in front, cushion in rear; C&S, cushion in front, solid in rear. Tire Sizes, d, dual. Motor Location, Betw seats, between seats. Cylinder Cast, Sing, singly or individually. Location of Valves, Opp, opposite, or T-head type; Top (2-cylinder motors only), L-head cylinder laid horizontal with valves up; R&H, at right and in head, L-head cylinder; L&H, at left and in head, L-head cylinder; 2-cyc, two-cycle motor, no valves; Back, L-head motor placed transversely with valves at rear. Water Circulation, Cent, centrifugal pump; Gear, gear pump; Thermo, thermo-siphon circulation; Air, air-cooled, no water radiator type; Finned, finned-tube; Cell, cellular or honeycomb; Sq-t, square-tube or flat-tube; Z-z-t, zig-zag-tube or crimped flat-tube. Ignition, Type, Sing, single; Doub, double; Dual-d, dual-double Make of Magneto (or other sparking device), Split, Splitdorf; Conn, Connecticut; King, Kingston; West, Westinghouse; Day-D, Dayton-Dick; Atw-K, Atwater-Kent. Spark Advance, Auto, automatic; 2-pt, two-point fixed, battery circuit fixed in retard, magneto in advance. Governor Type, Cent, centrifugal; L-b, loose-ball; Suct, suction; Hyd, hydraulic. Governor Drive, Motor, from motor; D-shaft, from driving shaft; F-wheel, from front wheel; Gearset, from gearset countershaft; Duplex, from both the motor and the driving shaft, by overrunning clutches.

in Tabulated Form for Quick Comparison

MOTOR						TRANSMISSION							SPRINGS		CONTROL		Pro- pulsion Taken By	Name and Mode	
GOVERNOR		SPEEDS		Carbur- eter Make	Lubrica- tion	Clutch Type	GEARSET			Total Gear- Ratio in High	Final Drive	Torque Taken By	Front	Rear	Steer	Levers			
Type	Drive	Motor in R.p.m.	Truck in M.p.h.				Type	Location	Speeds										
None	None			Scheb	Circ-spl	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	Tiffin	G
None	None			Scheb	Circ-spl	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	Tiffin	M
None	None			Strom	Circ-spl	Dry-d	Selec	Unit-m	3		Top worm*		1-Ell	1-Ell	Left		R-r	Trabold	T
None	None			Strom	Circ-spl	Dry-p	Selec	Unit-m	3		Top worm*		1-Ell	1-Ell	Left		R-r	Trabold	
None	None			Strom	Circ-spl	Dry-d	Selec	Unit-m	3		Top worm*		1-Ell	1-Ell	Left		R-r	Trabold	
None	None		50	B-Z	Circ-spl	Cone	Selec	Unit-x	3	3-1	Bevel	Tor-t	1-1 Ell	Cant	Left	Cent	Tor-t	Trumbull	15D
Cent	Motor	1,050	15	Breeze	Circ-spl	Dry-p	Selec	Unit-m	3	7-1	Top worm	R-r	1-Ell	1-Ell	Left	Cent	R-r	Universal	C
Cent	Motor	1,000	11½	Breeze	Circ-spl	Dry-d	Selec	Unit-j	3	10-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Universal	A
Cent	Motor	1,143	15	Strom	Circ-spl	Cone	Ind-c	Amid	3	8-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	U. S.	E
Cent	Motor	1,143	15	Strom	Circ-spl	Cone	Ind-c	Amid	3	8-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	U. S.	G
Cent	Motor	1,092	15	Strom	Circ-spl	Cone	Ind-c	Amid	3	7-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	U. S.	D
Cent	Motor	1,092	12	Strom	Circ-spl	Cone	Ind-c	Amid	3	9-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	U. S.	F
Suct	Motor	900	18	Strom	Circ-spl	Dry-p	Selec	Amid	3	7-1	Doub-r	T-arm	1-Ell	1-Ell	Left	Cent	T-arm	Velie	X
Suct	Motor	1,000	17	Strom	Circ-spl	Dry-p	Selec	Amid	3	7-1	Top worm	Springs	1-Ell	1-Ell	Left	Cent	Springs	Velie	U
Cent	Motor	1,000	15	Strom	Circ-spl	Dry-d	Selec	Amid	3	8-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Velie	
Cent	Motor	1,000	12	Strom	Circ-spl	Dry-p	Selec	Amid	3	10-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Velie	Z
Cent	Motor	1,000	8	Strom	Circ-spl	Dry-p	Selec	Amid	3	12-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Velie	ZS
			25	Carter	Splash	Cone	Selec	Unit-m	3	4-1	Bevel	Tor-t	1-Ell	1-Ell	Left	Cent	Springs	Vim	L&F
		1,250	16	Strom	Circ-spl	Cone	Selec	Unit-j	3	7-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Vulcan	2
		1,250	16	Strom	Circ-spl	Cone	Selec	Unit-j	3	7-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Vulcan	3
		1,250	14	Strom	Circ-spl	Cone	Ind-c	Unit-j	3	9-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Vulcan	4
		1,250	14	Strom	Circ-spl	Cone	Ind-c	Unit-j	3	9-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Vulcan	5
Cent	Motor	1,250	13½	Strom	Circ-spl	Cone	Prog	Unit-j	4	11-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Vulcan	7
None	None	1,800	30	Marvel	Circ-spl	Wet-d	Plan	Unit-m	2	6-1	Sing chn		1-Ell	1-Ell	Cent	None	R-r	Wagenhals	
Cent	Motor	1,000	14	Zenith	Circ-spl	Cone	Selec	Unit-m	4		Int-g4	Springs	1-Ell	1-Ell	Left	Cent	Springs	Walter	5
Cent	Motor	1,000	12	Zenith	Circ-spl	Cone	Selec	Unit-m	4		Int-g4	Springs	1-Ell	1-Ell	Left	Cent	Springs	Walter	6
Cent	Motor	1,000	10	Zenith	Circ-spl	Cone	Selec	Unit-m	4		Int-g4	Springs	1-Ell	1-Ell	Left	Cent	Springs	Walter	7
Cent	Motor	1,000	10	Zenith	Circ-spl	Cone	Selec	Unit-m	4		Int-g4	Springs	1-Ell	1-Ell	Left	Cent	Springs	Walter	Tractor
Cent	Motor	1,100				Wet-d			4		Bevel-4			Plat		Right		Ware	
None	None			White	Spl-press	Wet-p	Selec	Amid	4		Bevel	Springs	1-Ell	1-Ell	Left	C&L	R-r	White	GBBE
None	None			White	Spl-press	Wet-p	Selec	Amid	4		Doub-r	Springs	1-Ell	1-Ell	Left	C&L	R-r	White	TBC
None	None			White	Spl-press	Wet-p	Selec	Amid	4		Dbl chn		1-Ell	1-Ell	Left	C&L	R-r	White	TAD
None	None			White	Spl-press	Wet-p	Selec	Amid	4		Dbl chn		1-Ell	1-Ell	Left	C&L	R-r	White	TCD
		1,800	20	Strom	Circ-spl	Cone	Selec	Unit-j	3	7-1	Dbl chn		1-Ell	1-Ell	Right	Cent	R-r	Wichita	A
None	None	1,800	20	Strom	Circ-spl	Cone	Selec	Unit-j	3	8-1	Dbl chn		1-Ell	1-Ell	Right	Cent	R-r	Wichita	B
Cent	Motor	1,500	11	Strom	Circ-spl	Cone	Selec	Unit-j	3	9-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	Wichita	H
Cent	Motor	1,100			Circ-spl	Dry-d	Selec	Unit-m			Bevel	Tor-t	1-Ell	1-Ell	Left	Cent	Tor-t	Wilcox	T
Cent	Motor	1,100	16		Circ-spl	Cone	Selec	Unit-j	3		Dbl chn		1-Ell	1-Ell	Right	Cent	R-r	Wilcox	LA
Cent	Motor	1,100	14		Circ-spl	Cone	Selec	Unit-j			Dbl chn		Ellip	1-Ell	Right	Right	R-r	Wilcox	NA
Cent	Motor	1,100	13		Circ-spl	Cone	Selec	Unit-j			Dbl chn		Ellip	1-Ell	Right	Right	R-r	Wilcox	JA
		1,004	20	Zenith	Spl-press	Cone	Selec	Amid	3	5-1	Doub-r	Tor-t	1-Ell	1-Ell	Left	Cent	R-r	Willet	M
		945	15	Zenith	Spl-press	Cone	Selec	Amid	3	6-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	Willet	L
		945	15	Zenith	Spl-press	Cone	Selec	Amid	3	6-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	Willet	K
Cent	Motor	1,000	15	Marvel	Pressure	Cone	Selec	Unit-j	3	7-1	Dbl chn		1-Ell	1-Ell	Left	Cent	R-r	Wilson	B
Cent	Motor	1,150	18	Scheb	Circ-spl	Cone	Selec	Unit-j	3	6-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Willys	.65

Received Too Late to Classify

				King	Splash	Dry-d	Plan	Unit-m	2	7-1	Dbl chn		Ellip	Ellip	Right	Right	R-r	Handy Wagon, Jr.	
				King	Splash	Wet-d	Plan	Unit-m	2	7-1	Dbl chn		Ellip	Ellip	Right	Right	R-r	Handy Wagon	
				King	Splash	Wet-d	Plan	Unit-m	2	7-1	Dbl chn		Ellip	Ellip	Right	Right	R-r	Handy Wagon, Sr.	
Cent	Motor	1,250	18	Flech	Spl-press	Dry-d	Selec	Unit-m	3		Top worm	Springs	1-Ell	1-Ell	Left	Cent	Springs	Hurlburt	1
Cent	Motor	1,250	15	Flech	Spl-press	Cone	Selec	Amid	3		Top worm	Tor-t	1-Ell	1-Ell	Left	Cent	R-r	Hurlburt	2
Cent	Motor	1,250	13	Flech	Spl-press	Cone	Selec	Amid	3		Top worm	Tor-t	1-Ell	1-Ell	Left	Cent	R-r	Hurlburt	3
Cent	Motor	1,150	12*	Own	Pressure	Cone	Selec	Amid	4	10-1	Top worm	T-arm	1-Ell	1-Ell	Right	Right	R-r	Locomobile	3
Cent	Motor	1,150	12*	Own	Pressure	Cone	Selec	Amid	4	10-1	Top worm	T-arm	1-Ell	1-Ell	Right	Right	R-r	Locomobile	4
Cent	Motor	1,350	13	Strom	Circ-spl	None	Elec	Unit-m	2	20-1	Doub-r	Springs	1-Ell	1-Ell	Left		R-r	C. T.	Tractor
Cent	Motor	1,200	15	Ray	Splash	Wet-d	Selec	Unit-j	3	7-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Transit	E
Cent	Motor	1,200	14	Ray	Splash	Wet-d	Selec	Unit-j	3	9-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Transit	F
Cent	Motor	1,200	12	Ray	Splash	Wet-d	Selec	Unit-j	3	10-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Transit	T
Cent	Motor	1,200	10½	Ray	Splash	Wet-d	Selec	Unit-j	3	13-1	Dbl chn		1-Ell	1-Ell	Right	Right	R-r	Transit	V
Suct	Motor	1,500	25	Ray	Press	None	Fric	Amid	5		Dbl chn		Ellip	Ellip	Right	Cent	R-r	Dispatch	L
Cent	Motor			Carter	Circ-spl	Wet-d	Selec		3		Top worm		1-Ell	1-Ell	Right	Right		Morton	1
L-b	Motor			Carter	Spl-press	Wet-d	Selec		3		Top worm		1-Ell	1-Ell	Right	Right		Morton	2
L-b	Motor			Strom	Spl-press	Wet-d	Selec		3		Top worm	Tor-t	1-Ell	1-Ell	Right	Right	Springs	Morton	2½
							Selec		4		Top worm							Morton	3
Cent	Motor			Carter	Circ-spl	Wet-d	Selec		3		Top worm		1-Ell	1-Ell	Right	Right		Morton	3½
Cent	Motor			Carter	Circ-spl	Wet-d	Selec		3		Top worm		1-Ell	1-Ell	Right	Right		Morton	5
							Selec		4		Top worm							Morton	6
			14		Spl-press	Wet-d	Selec		3		Top worm							Morton	Tractor

Carburator Make, Strom, Stromberg Scheb, Schebler; Ray, Rayfield; Excol, Excelior; King, Kingston; B-Z, Breeze-Zephyr. Lubrication, Splash, non-circulating or simple splash; Circ-spl, circulating-splash; Spl-press, splash-pressure; Fuel-inj, fuel injection, oil mixed with fuel; Pressure, pressure feed, no splash. Clutch Type, Dry-p, dry plate; Dry-d, dry multiple disk; Wet-d, wet disk or disk-in-oil; R-cone, reversed cone or inverted cone; Exp-a, expanding shoe; Cont-b, contracting band. Gearset Type, Prog, progressive sliding gear; Selec, selective sliding gear; Plan, planetary; Ind-c, constant-mesh individual-clutch; Fric, friction; Hyd, hydraulic; Elec, Electric. Gearset Location, Amid, amidships; Unit-m, unit with motor; Unit-j, unit with jackshaft; Unit-x, unit with axle; Unit-e, unit driveshaft. Final Drive, Bevel, direct bevel; Doub-r, double-reduction, bevel and spur; Int-g, internal gear; Top worm, worm gear with worm on top; Dbl chn, double chain; Sing chn, single chain; f, to front wheels; 4, to all four wheels. Driving Torque, R-r, radius rods; T-arm, torque-arm; Tor-t, torsion tube; Sub-f, sub-frame. Springs, Ellip, elliptic; 1-Ell, half-elliptic; 1-1 Ell, quarter-elliptic; 1-1 Ell, three-quarters-elliptic; Plat, platform; T-ell, transverse elliptic; Cant, cantilever; Comb, combination of half-elliptic and elliptic on double frames. Steering, Cent, center. Levers, Cent, center. C&r, gearshift center, brake right; C&l, gearshift center, brake left; St-co, steering column. Propulsion, R-r, radius rods; T-arm, torque arm; Tor-t, torsion tube; Sub-f, sub-frame.

Electric Passenger Cars

Lowered Weight and Increased Simplicity Feature of Electric Passenger Cars for the New Year

DURING the year gone by the manufacturers of electric vehicles have been no less active in their efforts to improve their products than have the makers of gasoline vehicles. And, apparently they have sought to bring about improvement in a not altogether different way.

There seems to have been a concerted effort to increase efficiency, simplifying mechanism and reducing weight insofar as that can be done without decreasing the liberal factor of safety. There is a tendency toward the use of a greater amount of aluminum for bodies, and the use of pressed steel and small drop forgings has made some advance.

Although that part of the mechanism of an electric which requires occasional inspection and adjustment has in the majority of cases been easily accessible, makers have succeeded in a number of cases in further reducing the time necessary to get a such parts. Accessibility

never has been a very strong talking point with electric makers for the good and sufficient reason that there is scarcely anything but the battery which requires to be getatable. Hence, what attention has been devoted to increasing accessibility has been aimed at the battery compartments rather than at the mechanism. For the most part batteries are more easily inspected, cleaned and repaired now than has been the case in the past.

Mileage Is Increasing

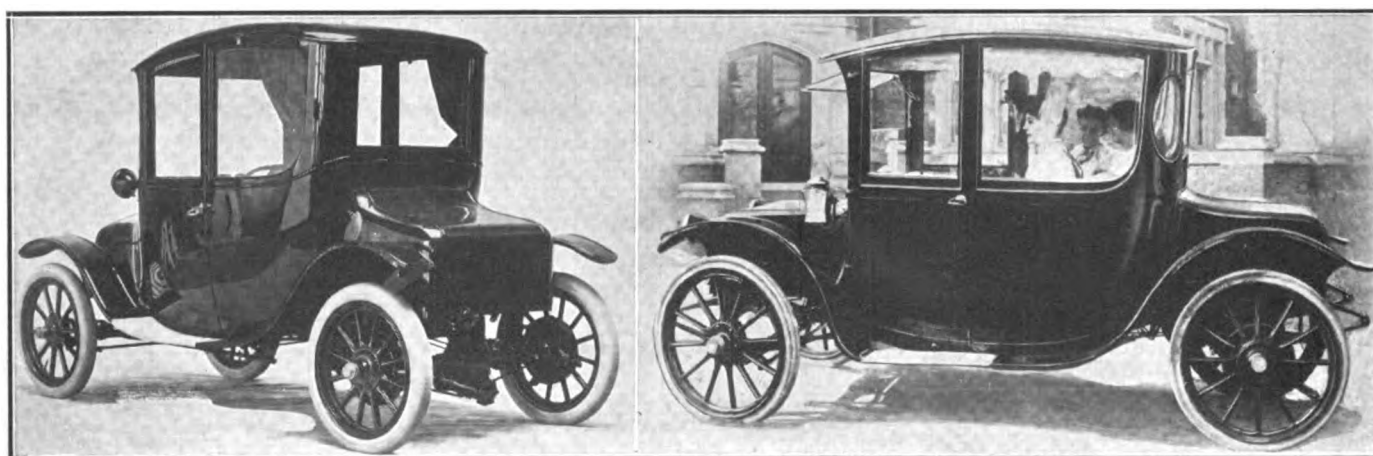
As is altogether natural, no little effort has been made to increase mileage, and in nearly every instance these efforts have been successful. In a number of cars this desirable result has been brought about by the simple expedient of more carefully enclosing working parts so that dust and dirt is more effectively kept in its proper place and out of the mechanism. In other cases it has

been accomplished by substituting pneumatic for solid tires.

That there have been no startling developments can be attributed only to the fact that the electric vehicle has reached a plane of perfection which may be looked upon as a natural resting place, though this fact cannot be construed to mean that makers have any intention of letting well enough alone.

Of the makes of cars that are now listed, all the old and well-known names remain on the roster, and during the past twelvemonth a number of new names have been added. These include the Milburn, the Columbia, the Storms and the Ward. In none of them is there any difficulty in tracing the modern tendency toward reasonable lightness, coupled with that degree of substantiality necessary for economy.

Finish, as a rule, is even better, if that is possible, and there has been an increase in the amount of equipment.



Left—One of the Milburn models which makes its first appearance in the electric car field; note the underlaid worm drive. Right—Model 109 Waverley, a four-passenger brougham driven from the rear seat

BAKER

There will be four models in the line produced by the Baker Motor Vehicle Co., Cleveland, O., for the forthcoming season, two of them having bevel final drive and two of them being by worm. The worm drive models are a coupe, which with lever steer, is styled Model DA, and with wheel steer, DB, and sells for \$2,800; Model BBD, a double drive brougham with two separate controller and steering levers, at \$3,250; and the

bevel drive models are VAE, lever steer, and VAEF, wheel steer, coupe, at \$2,600; and WA, wheel steer, or WB, lever steer, open roadster, which sells for \$2,300.

The bevel and worm drive chassis are quite different in their construction. Both have four-pole series-wound high-speed motors, with the armature mounted on imported ball bearings. The transmission system in the worm drive model is direct by shaft with no intermediate reduction, the torque reaction being absorbed by the propeller shaft housing; the forward end of the motor is attached to the frame by means of a ball and socket joint. In

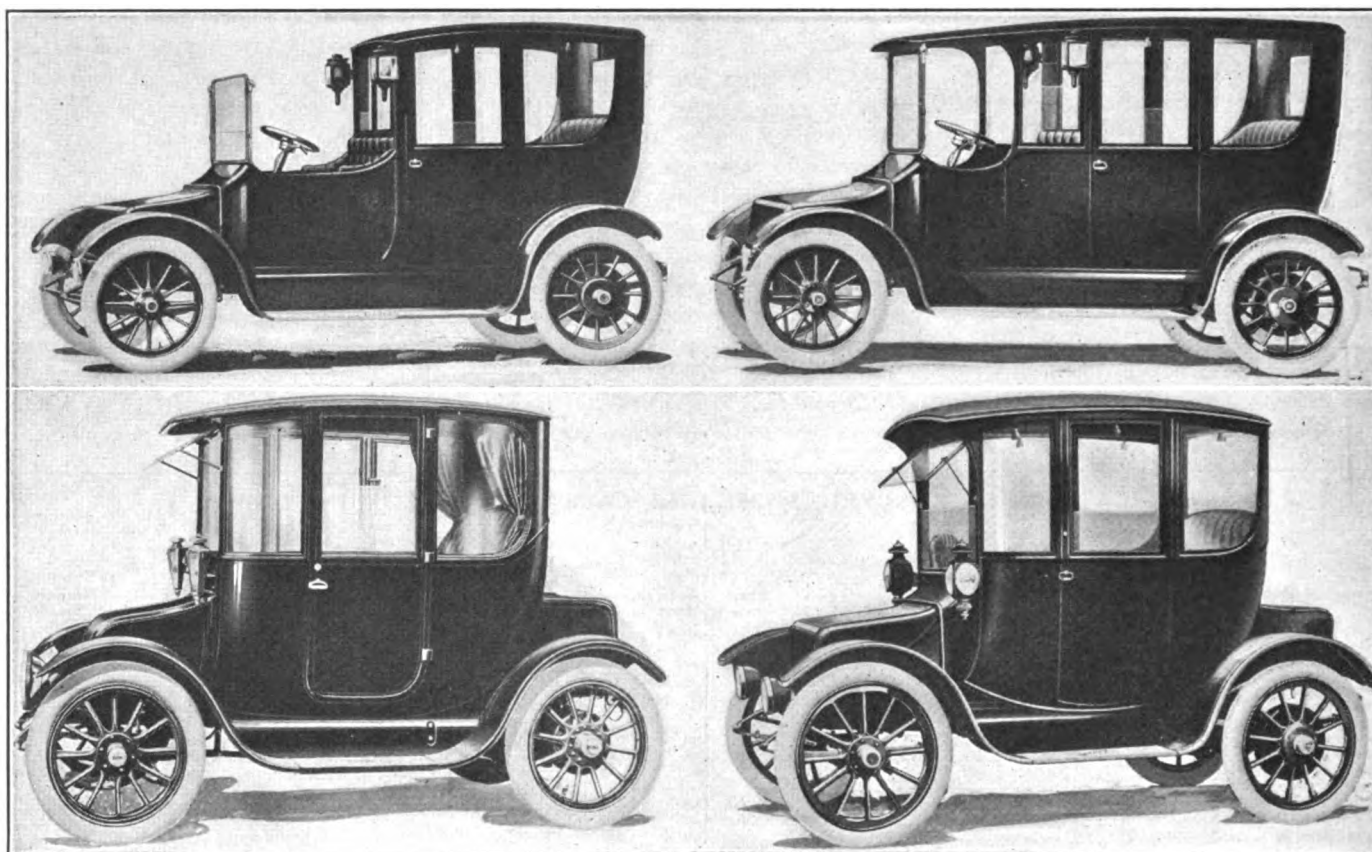
the bevel drive model power is transmitted from the motor to a countershaft by silent chain enclosed in a dustproof case and thence by shaft and two universal joints in a straight line to the rear axle.

All controllers are of the continuous torque drum type and are enclosed. The battery equipment consists of 32 cells, 11-plate, in Model DA; 34 cells, 11-plate, in Models WA and VAE, and 42 cells, 11-plate, in Model BBD. Tires may be either 32 x 4 special electric pneumatic or 34 x 4 cushion in Model DA, WA and VAE; in Model BBD the tire equipment

SPECIFICATIONS OF ELECTRIC PASSENGER CARS FOR THE COMING YEAR

Name and Model	Body Style	Seats	Price	POSITION OF		Wheel base	Tires, Kind	BATTERY		Mileage per Charge at 20 M.P.H.	Make of Motor	Final Drive	Forward Speeds
				Steer	Control			Make and No. Cells	Amp. Hr. Capacity				
American Argo, B	Roadster	4	\$2,350	Wheel	Rear	108½	Opt	Exide, 40	137½	75-90	Westinghouse	Bevel	5
American Argo, A	Brougham	4	2,650	Wheel	Rear	108½	Opt	Exide, 40	137½	75-90	Westinghouse	Bevel	5
American Argo, C	Brougham	5	2,800	Wheel	Front	110	Opt	Exide, 40	137½	75-90	Westinghouse	Bevel	5
American Borland, 52	Roadster	2	2,250	Wheel	Rear	96	Opt	Exide, 42	137½	75-90	Gen. Electric	Bevel	7
American Borland, 50	Coupe	5	2,550	Lever	Opt	96	Opt	Exide, 40	137½	75-90	Gen. Electric	Bevel	6
American Borland, 60	Limousine	7	5,500	Wheel	Front	123	Opt	Exide, 42	204	75-90	Gen. Electric	Bevel	6
American Broc, 33	Brougham	5	3,100	Lever	Rear	96	Opt	Exide, 40	137½	75-90	Westinghouse	Bevel	5
American Broc, 34	Brougham	5	3,150	Lever	Front	96	Opt	Exide, 40	137½	75-90	Westinghouse	Bevel	5
American Broc, 36	Brougham	5	3,200	Lever	Double	96	Opt	Exide, 40	137½	75-90	Westinghouse	Bevel	5
Bailey, F	Roadster	2	2,900	Wheel		112	Pneu	Edison, 60	187½	100	Gen. Electric	Chain	6
Bailey, F	Touring	4	3,300	Wheel		132	Pneu	Edison, 60	225	100	Gen. Electric	Chain	6
Baker, WA & WB	Roadster	2	2,300	Opt		88	Opt	Exide, 34			Gen. Electric	Bevel	6
Baker, VAE & VAF	Coupe	4	2,600	Opt		88	Opt	Exide, 34			Gen. Electric	Bevel	6
Baker, DA & DB	Coupe	4	2,800	Opt		90	Opt	Exide, 32			Gen. Electric	Worm	7
Baker, BBD	Brougham	5	3,250	Lever	Double	100	Opt	Exide, 42			Gen. Electric	Worm	6
Beardsley, 200B	Roadster	3	2,600	Wheel		103	Pneu	Gould, 42	168	90	Westinghouse		5
Beardsley, 300B	Victoria	5	2,750	Lever	Double	103	Pneu	Gould, 36	193	75	Westinghouse		5
Beardsley, 100B	Brougham	5	3,000	Lever	Double	103	Pneu	Gould, 36	193	75	Westinghouse		5
Buffalo, 36	Brougham	5	3,250	Wheel	Front	102	Opt	Opt, 42	140	50	Own	Sp. Bevel	5
Century, LB	Brougham	5	3,250	Opt	Opt	104	Opt	Willard, 42	165	85-95	Gen. Electric	Sp. Bevel	4
Chicago, 151 & 153	Brougham	5	2,650	Lever	Rear	96	Cush	Exide, 40	165	70-80	Westinghouse	Sp. Bevel	4
Chicago, 152	Limousine	5	2,850	Lever	Front	104	Cush	Exide, 40	165	70-80	Westinghouse	Sp. Bevel	4
Columbian, R	Roadster	2	950	Lever	Rear	98	Pneu	Opt, 26	135	75-85	Optional	Worm	5
Columbian, B	Brougham	4	1,450	Lever	Rear	98	Pneu	Opt, 26	135	75-85	Optional	Worm	5
Columbian, C	Coupelet	3	1,250	Lever	Rear	98	Pneu	Opt, 26	135	75-85	Optional	Worm	5
Detroit, 55	Brougham	4	2,600	Lever	Rear	94	Opt	Own, 40	168	70	Own	Bevel	5
Detroit, 50	Cabriolet	4	2,650	Lever	Rear	100	Opt	Own, 42	178	75	Own	Worm	5
Detroit, 51	Brougham	4	2,850	Lever	Rear	100	Opt	Own, 42	178	75	Own	Worm	5
Detroit, 53	Brougham	5	2,950	Lever	Front	100	Opt	Own, 42	178	75	Own	Worm	5
Detroit, 54	Brougham	5	2,950	Lever	Rear	100	Opt	Own, 42	178	75	Own	Worm	5
Detroit, 52	Brougham	5	3,000	Lever	Double	100	Opt	Own, 42	178	75	Own	Worm	5
Flanders, K	Colonial	4	1,750	Lever	Rear	100	Pneu	Willard, 30	135	75	Wagner	Worm	6
Grinnell, S	Coupe	5	3,000	Lever	Rear	100	Opt	Own, 40		80	Own		5
Grinnell, R	Brougham	5	3,400	Lever	Double	105	Opt	Phila, 40			Own		5
Milburn, 151	Roadster	3	1,285	Wheel		100	Opt	Phila, 17	205	50-75	Gen. Electric	Worm	4
Milburn, 15	Coupe	4	1,485	Lever	Rear	100	Opt	Phila, 20	180	50-75	Gen. Electric	Worm	4
Ohio, 11	Coupe	4	2,400	Lever	Rear	94	Pneu	Own, 36		75	Westinghouse	Bevel	4
Ohio, 21	Roadster	3	2,650	Lever	Rear	98	Opt	Exide, 42		75	Own	Opt	5
Ohio, 41	Brougham	5	2,900	Lever	Rear	98	Opt	Exide, 42		75	Own	Opt	5
Ohio, 51	Brougham	5	3,250	Lever	Double	98	Opt	Exide, 44		75	Own	Opt	5
Ohio, 61	Coupe	5	3,250	Lever	Double	98	Opt	Exide, 44		75	Own	Opt	5
Rauch & Lang, R5	Roadster	2	2,600	Lever	Rear	92	Opt	Exide, 41	130	50-100	Hertner	Worm	6
Rauch & Lang, CR5	Roadster	3	2,800	Lever	Rear	92	Opt	Exide, 41	130	50-100	Hertner	Worm	6
Rauch & Lang, B5-BX5	Brougham	4	2,950	Lever	Rear	92	Opt	Exide, 41	130	50-100	Hertner	Worm	6
Rauch & Lang, J5	Brougham	5	3,200	Lever	Double	102	Opt	Exide, 42	130	50-100	Hertner	Worm	6
Rauch & Lang, TCS-TXC5	Limousine	7	4,000	Wheel	Front	106	Opt	Exide, 42		40-90	Hertner	Worm	6
Standard, M4	Coupe	4	1,990	Lever	Rear	96	Opt	Exide, 32	137½	60-75	Westinghouse		6
Storms	Roadster	2	750	Opt	Front	90	Opt	Opt, 16				Bevel	4
Ward, ES	Coupe	4	2,100	Lever	Front	96	Pneu	Own, 40	180		Gen. Electric	Bevel	4
Waverley, 90	Cabriolet	3	2,000	Wheel	Front	104	Opt	Opt, 34	137	75	Own	Her'b'ne	5
Waverley, 104	Brougham	4	2,400	Lever	Front	106	Opt	Opt, 42	162	75	Own	Her'b'ne	4
Waverley, 109	Brougham	4	2,750	Lever	Rear	106	Opt	Opt, 42	162	50-90	Own	Her'b'ne	4
Waverley 108	Limousine	5	3,000	Lever	Front	111	Opt	Opt, 42	162	75	Own	Her'b'ne	4
Woods, 1522	Brougham	4	2,875	Lever	Rear	100	Cush	Own, 40	160	80	Own	Worm	5
Woods, 1593	Brougham	5	3,150	Lever	Front	110	Cush	Own, 42	170	80	Own	Worm	5
Woods, 1504	Brougham	5	3,150	Lever	Rear	110	Cush	Own, 42	170	80	Own	Worm	5
Woods, 1501	Brougham	5	3,250	Lever	Double	110	Cush	Own, 42	170	80	Own	Worm	5

ABBREVIATIONS: Opt, optional; Pneu, pneumatic; Her'b'ne, herringbone; Sp. Bevel, Spiral bevel.



Upper—Two of the new Rauch & Lang models, both of them styled town cars. Lower right—Another of the new Rauch & Lang models. Lower left Baker model DA lever-steer coupe

is 34 x 4½ special electric pneumatics front and rear or 36 x 4 front and 36 x 4½ cushion tires on the rear.

There are two independent sets of brakes of the internal expanding variety, both being mechanically operated and applying on rear wheel drums; on all models semi-elliptic springs are used in front; the rear suspension in Models BBD and DA consists of cantilever springs and in Models WA and VAE the rear springs are full-elliptic members.

BUFFALO

Changes of a radical nature have been made in the coupe and roadster models which are being marketed by the Buffalo Electric Vehicle Co., Buffalo, N. Y.; not only do the new models differ from their predecessors, but they are quite different from any other electrics. Primarily, a brand new seating arrangement, with the steering wheel and control levers directly in the center, has been adopted, the driver occupying a seat set slightly forward of two seats on either side. At present but two models will be marketed, a coupe at \$3,300, seating five passengers, and a roadster, also seating five, at \$2,600.

Among the more important chassis changes which apply to both, are the adoption of cantilever rear springs, the

use of a double-drop frame and a ball jointed forward motor support, and a complete revision of body lines which has brought about a true streamline appearance. As heretofore, a lever on the steering wheel and a pedal-operated controller regulate the motor, the foot controller also operating the service brake. The pedal controller is for use only up to about 9 miles an hour and is to facilitate control in heavy traffic; above this speed the hand controller is used.

The motor is a special design and is so connected that it automatically operates as a brake on down grades, the current thus generated being fed back to the battery. The controller mechanism is somewhat unusual in that it is a radial arm passing over a number of contacts. The reverse is obtained by depressing a knob in the center of the steering column. Instead of being supported on a double trunnion the motor now has a single ball and socket joint at the front and there are no universals in the drive shaft. Torque is absorbed by the casing; final drive is by spiral bevel gears.

Both bodies are exceptionally roomy, doors being 26 inches wide. In the coupe a double rain-vision windshield is fitted and sashless windows operate in felt runways to obviate the possibility of rattle; the front seats in this model swivel, but in the roadster they fold under the cowl when not in use.

WOODS

The single chassis produced by the Woods Motor Vehicle Co., Chicago, Ill., has been almost completely reconstructed, and in the process has been made entirely different from any previous Woods vehicle; five new body styles have been brought out. Instead of bevel drive the Woods now has underslung worm drive; the braking system, the motor support and the spring suspension are all new. For the first time the Woods company has placed on the market a model with double control. The complete line includes Model 1501, which is the new dual drive car; Model 1503, front drive, and 1504, rear drive, all of these being five-passenger broughams; Model 1522, a rear drive four-passenger brougham, and Model 1330, a three-passenger roadster, in which the bevel gear drive is retained; all models have lever steer.

The spring suspension of the chassis is one of its distinctive features and is different from anything else of its kind. Instead of being mounted at the side of the chassis frame, or beneath it, the spring members are housed directly in the channel; in the rear support the lower spring member instead of being mounted on the axle is mounted on ra-

dus beams. Both front and rear springs are full-elliptic.

The reduction by herringbone gears between the motor and the axle has been eliminated and in its place there is now a motor supported on ball joints in a sub-frame and driving direct by shaft without intermediate reduction to an under-slung worm. The brakes have been redesigned with the bands increased in size from 14 x 1¾ inches to 16 x 2 inches.

Formerly, battery equipment consisted of 40 cells, of 11 plates, but this has been increased to 42 cells. All cars have five forward speeds, with five reverse, the controller being of the drum type, and all are equipped with 34 x 4-inch tires in front and 38 x 4½-inch rear tires, the wheelbase of the five-passenger brougham being 110 inches, of the four-passenger car 100 inches, and of the roadster 92 inches.

In the dual control car the mechanism is so arranged that one set of control elements automatically becomes inoperative when the other set is in use; if the brake should be applied from the front control system it is immediately released when the rear controller is placed in the

first speed position. The same applies if the brake is set from the rear and the operator is in the front seat.

DETROIT

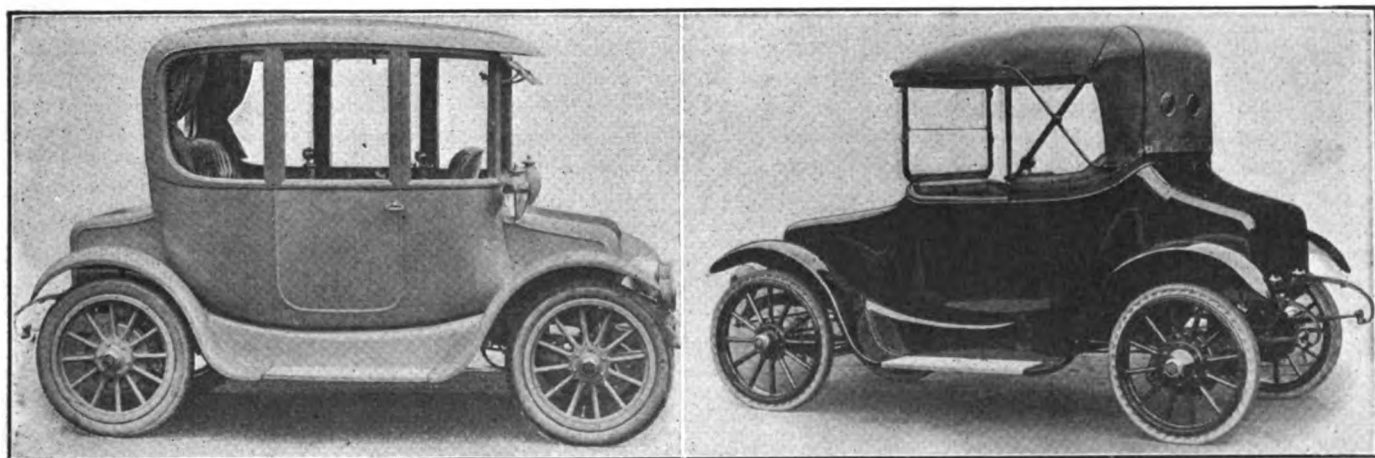
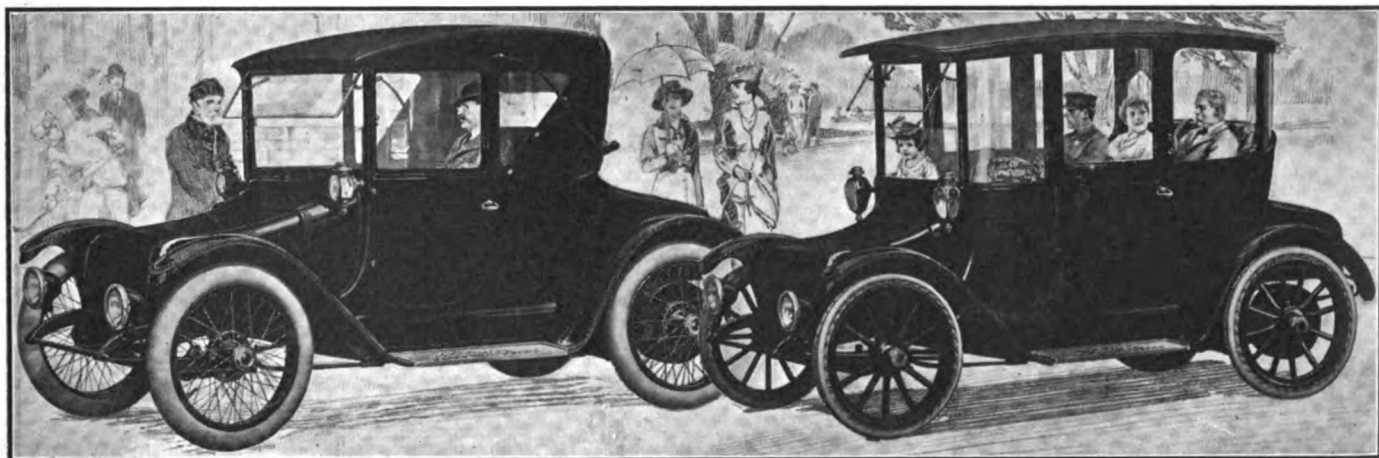
The Anderson Electric Car Co., Detroit, Mich., has considerably revamped its line, by way of increasing efficiency and accessibility and simplifying the mechanism, and has brought out a new cabriolet model on its worm-driven chassis to sell for \$2,650. The cabriolet is designated Model 50 and seats four, the chassis being the same as in the other worm-driven models.

The most important alterations in the carried-over models have as their object a general simplification of the mechanism with a consequent increase in accessibility. At the same time, bodies have been slightly enlarged, the seats being wider and the leg-room increased. Door windows now are sashless and are fitted with drip moldings and door panels are in one piece of aluminum.

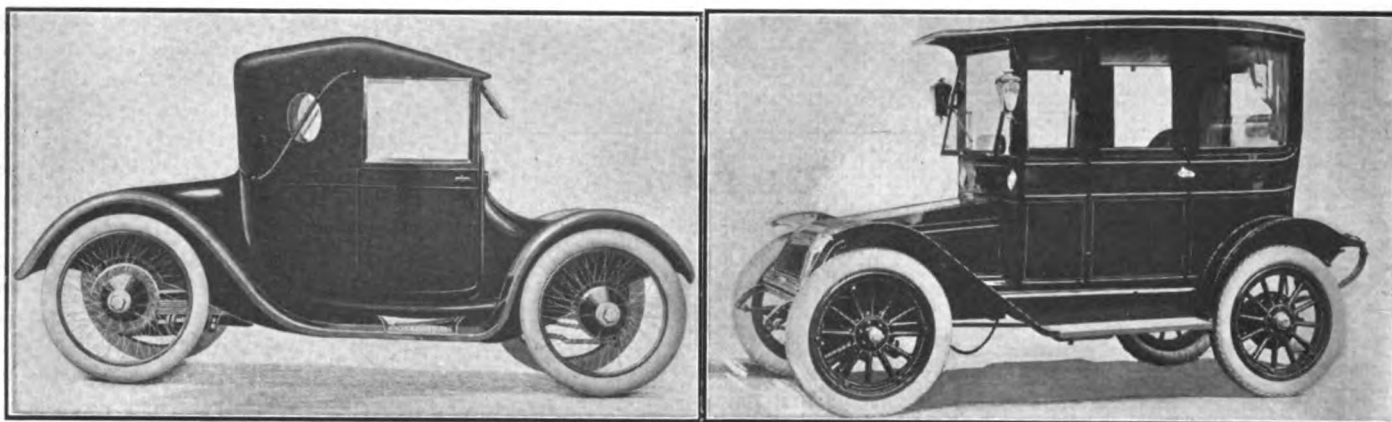
Control elements are substantially the same, there being a steering lever and

lever-operated controller; there are three pedals, one each operating an independent set of brakes and the third an emergency cutout which cuts off the power, regardless of the position of the controller handle, and sets both brakes. The controller has been redesigned to provide easier and more certain action, lubrication of the drum segments being accomplished by wicks which dip into an oil supply; the controller mechanism is mounted on ball bearings. Another new feature is the addition of a compartment ahead of the motor and accessible through a trap in the floor, containing the controller mechanism, the motor brake, the Klaxet horn, switches, etc. The reverse switch is of the type formerly used but it is now mounted in a water-tight compartment fastened to the frame. The new controller position has given additional storage space beneath the rear seat.

Among the other minor improvements, the battery hood props are of a new design and lock the hood in a raised position automatically; the lamp brackets now have permanently soldered connections and a dimming attachment has been added; battery jars are now of the



Upper—Diversity in Detroit electric types, left showing the new cabriolet with wire wheels and collapsible top, and right showing one of the forward drive models equipped with cushion tires. Lower left—Ohio model 61, a five-passenger coupe with double control system, selling for \$3,250; the domed fenders and well rounded body lines are distinctive. Lower right—Ohio model 21 roadster, which sells for \$2,650



Columbian coupelet-brougham, another of the newcomers which makes its first appearance this year

Ward brougham, also making its first appearance on the market; note position of battery at front

high-ribbed type, 42 cells of 15 plates each, and the sediment space is sufficient to eliminate the necessity for washing; also, the battery compartments are so arranged that each individual cell is easily accessible.

The transmission elements are much the same, except for minor refinements. A medium-speed motor is used and in all but one model drives direct through worm gearing; in the other model bevel gears are used. The axle housing has been strengthened and lightened and the frame has been widened at the rear to give added support to the body and increase the battery space, the battery weight now being closer to the wheels with a consequent lessening of strain on the axles and spring brackets. An entirely new construction has been adopted in forming the gusset plates integral with the side members. Self-lubricating cups have been added to the springs. Either Goodrich, Cord pneumatic or Motz cushion tires are standard equipment.

BORLAND

The Borland models of the American Electric Car Co., Saginaw, Mich., differ in a number of respects from the Argo models, the most prominent difference being the use of double reduction by Renault silent chain to the propeller shaft and bevel gears in the rear axle. Three models are produced, these being a forward-drive limousine, seating seven, and selling for \$5,500; a rear or forward coupe, for five, at \$2,550, and a roadster for two at \$2,250.

The chassis for these three models is the same except that the limousine has a wheelbase of 123 inches and the other models are 96 inches between wheel centers. The limousine is equipped with 42 cells of 17-plate thin type Exide battery,

the complete installation being at the front. The roadster has 42 cells, of 11 plates, equally divided between front and rear, and in the coupe there are 40 cells of 11 plates similarly divided.

The motor is a General Electric series-wound machine suspended from the center of the chassis with Renault chain drive to the propeller shaft to bevel gears in a tubular axle. Both sets of brakes are pedal-operated and are located on rear wheel drums. Springs are semi-elliptic in front and underslung full-elliptic in rear, the frame being a channel steel section.

STORMS

The Storms Electric Car Co., Detroit, Mich., of which William E. Storms, formerly of the Anderson Electric Car Co., is the moving spirit, is a newcomer in the electric vehicle field and will place on the market two models, a coupe at \$950 and a roadster at \$750. Both will be modern creations on a 90-inch wheelbase with a tread of but 44 inches, which, therefore, places them in a class by themselves. The battery, which consists of 16 cells of any standard make, lead type, is located in two compartments, front and rear, and has an ampere-hour capacity of 45-60 at 18 miles per hour. A special motor is located in the center of the chassis, whence it drives direct by shaft to bevel gears in a tubular full-floating axle; the front axle also is tubular. The controller gives four forward and three reverse speeds and is of the drum type. There are two sets of brakes, external and internal, on rear wheel drums, both operated by pedal. The frame is a channel section mounted on semi-elliptic front and three-quarter elliptic rear springs.

The standard body color is blue with either broadcloth or leather upholstery

to match. Both front and rear wheels are shod with 28 x 3-inch cushion or pneumatic tires.

MILBURN

The Milburn Wagon Co., Toledo, O., is new to the field of electric vehicle makers, though it has long been a vehicle producer. The four models which it has brought out are modern creations which have as features light weight and low cost. The roadster model, for example, sells for \$1,285; the coupe for \$1,485, and a closed delivery wagon at approximately \$1,085, the price varying slightly with the type of body. The fourth model is a cabriolet.

The chassis is the same for all three except that the wheelbase of the passenger cars is 100 inches and the rear springs are cantilevers, whereas the wheelbase of the delivery is 90 inches and the rear springs are half-elliptics. In each case a General Electric motor, in conjunction with a Philadelphia battery, furnish power through direct worm gearing, controllers also being of General Electric make. The standard battery equipment consists of 20 cells, which, according to the makers, gives the roadster a mileage of 60 to 75, the coupe about 70 and the delivery approximately 50.

The passenger cars are well fitted and finished, the coupe having modern sashless windows with mechanical lifters and French fabric upholstery. The doors in both passenger models are exceptionally wide and the bodies are low hung.

Steering is vested in a wheel, except in the coupe, which has a lever, with a lever type controller handle operating a non-arc drum mechanism giving four forward and two reverse speeds. By way of conserving the battery an alarm is fitted which sounds if the brakes

are applied with the current on. Liberal use is made of anti-friction bearings throughout the chassis, front wheels being mounted on Bower rollers and the rear axle, which is three-quarter floating, on heavy-duty Hyatts.

The capacity of the delivery model is 750 pounds exclusive of the operator and one passenger; the chassis price is \$985, a variety of body styles being furnished at \$100 upward. Tires are 32 x 3-inch solids.

WARD

Two new models have been added by the Ward Motor Vehicle Co., New York, to supplement its line of larger electric trucks, which are continued practically without change. These are a coupe model, which sells for \$2,100, and a 750-pound capacity delivery wagon at \$875.

Contrary to the usual practice, the coupe model has its battery—40 cells of 15-plate lead—grouped in a single compartment at the front, where it is all instantly accessible; the mileage is given as 35 to 45 per charge. The body is roomy and by way of ensuring the maximum of comfort it has been mounted on 64-inch coach springs and 34 x 4½-inch pneumatic tires. The wheelbase is 96 inches and the upholstery is deep and yielding, the rear seat accommodating three passengers; two additional passengers are accommodated on individual swivel chairs in front.

The car is driven from the left through a lever type steering arm and lever controller handle. The motor is a General Electric series-parallel machine rated at 3½ horsepower and located amidships, whence it drives direct by shaft to a single pair of bevel gears in a Timken floating axle. There are two sets of expanding foot-operated brakes on rear wheel drums.

The delivery wagon, which is styled the Ward Special, differs from the coupe in several respects though the drive is substantially the same and is direct to a floating axle through bevel gears. The motor, however, is a Westinghouse. The normal speed varies from 10 to 12 miles an hour, the mileage capacity being from 35 to 45 on one charge. A steering wheel takes the place of the lever used in the coupe, and the wheels are shod with 32 x 2½-inch solid tires. There is a single set of expanding brakes on rear wheel drums.

The remainder of the Ward line includes a 1,000-pound truck at \$1,250; 2,000 pounds, at \$1,500; 4,000 pounds, at

\$1,900; 7,000 pounds, at \$2,450, and 10,000 pounds, at \$2,950.

ARGO

The Argo models of the American Electric Car Co., Saginaw, Mich., are three in number, a forward-drive brougham, seating five, at \$2,800; a rear-drive brougham, seating four, at \$2,650, and a rear-drive roadster, seating four, at \$2,350. The chassis for these three models is the same except that the forward-drive brougham has 110-inch wheelbase whereas the other two models have 108½-inch wheelbase; all are equipped with 36 x 4 tires, either pneumatic or cushion.

The battery equipment is the same for all three cars and consists of 40 cells of Exide 11-plate MV Hy-Cap; in the front-drive brougham model this is divided 24 cells in front and 16 in the rear, and in the other models the batteries are all in front. The ampere-hour capacity is 137½ and the mileage per charge varies from 75 to 95.

The motor is a Westinghouse, series-wound machine, and is located on the rear axle and drives through a combination of herringbone and bevel gears, giving two reductions, the final gear ratio being 4 to 1. Two sets of brakes are fitted on rear wheel drums, both being operated by pedal. Springs are semi-elliptic in front and three-quarter in rear.

CENTURY

The latest model to come from the plant of the Century Electric Car Co., Detroit, Mich., is a five-passenger brougham finished in blue and black, with a choice of cords or bedford cloth upholstery, at \$3,250. As heretofore, the battery is divided, half being in front and half at the rear; the ampere-hour capacity is given as 165 and the mileage per charge as 85 to 95 at 20 miles per hour. The battery equipment consists of 42 cells of Willard 13-plate thin type, though any other standard make is optional. Control is vested in either lever or wheel steering and a magnetic type controller, giving four speeds forward and four reverse.

The motor is a series-wound General Electric machine centrally located in the chassis, whence it drives direct to spiral bevel gears with but one reduction. There are two sets of service brakes, one internal expanding and mechanically oper-

ated, and the other electrical; the emergency brakes are pedal operated. The standard wheelbase is 104 inches, with either 36 x 4½-inch cushion tires or 34 x 4½-inch pneumatics. The frame is a channel-steel section underslung in front from semi-elliptic springs and overslung at the rear on platform springs, the lower members of which attach below the axle.

WAVERLEY

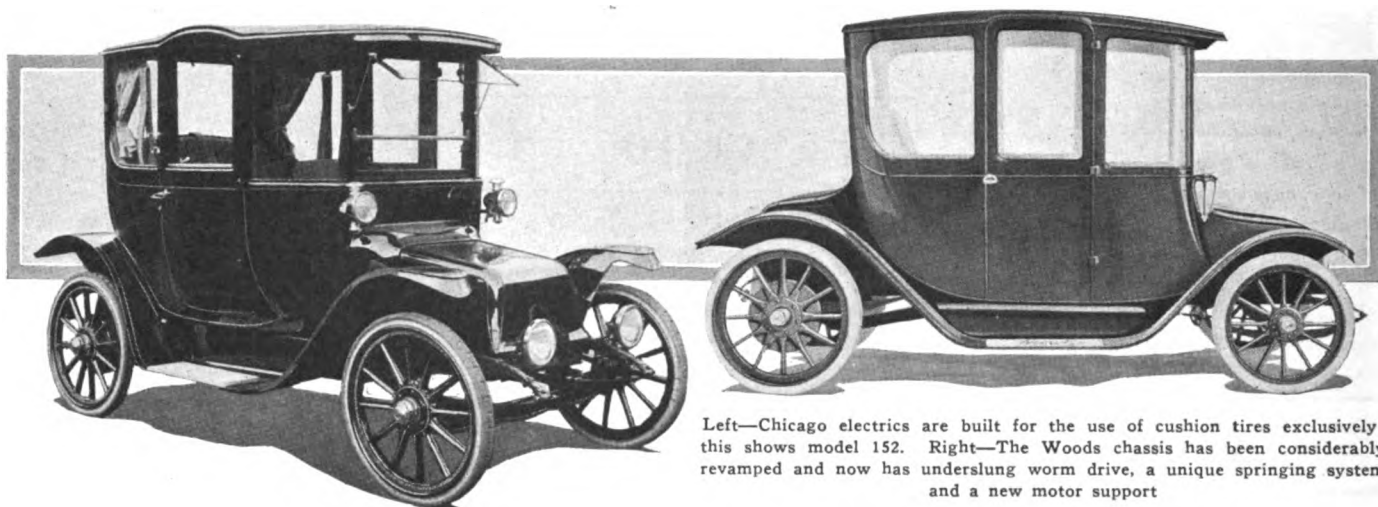
A departure from previous practice has been made by the Waverley Co., Indianapolis, Ind., in the use of aluminum for the roof and panels of a new four-chair brougham which has been brought out. The lines of the car are entirely new, the rear corners being rounded, the battery boxes, though still mounted fore and aft, being lower, the windows larger and fitted with sashless glass and oval windows being placed at the rear corners; also a curved sill has been adopted, thus lowering suspension by 7 inches without reducing road clearance.

The upholstery in the new model is luxurious and may be any of a number of imported corded fabrics or special limousine leather; the standard color is black with majestic blue panels, though other colors are optional with the purchaser. Either cushion or pneumatic tires are fitted.

The standard Waverley chassis, with its distinctive drive through herringbone gears, transverse shaft and silent chain, is continued practically without change, the suspension remaining of what is termed the five-quarter elliptic type. The motor is driven by a 42-cell battery of either 11 or 13 plates of any standard make; either Ironclad Exide or Edison is supplied at a slightly higher cost. In any case the battery capacity is sufficient for 75 miles running on one charge. A knife blade type controller operated by a vertical lever regulates the speed, the steering being by a horizontal lever. As heretofore, the motor is a medium-speed, four-pole, series-wound machine with a nominal speed of 1,500 r. p. m. and a voltage of 80. The driving axle is of the floating type and the front axle a one-piece drop forged I-beam section.

The brakes are unchanged, there being a double set of the expanding variety in addition to a motor brake, the latter being of the band type and operating through the differential which acts as an efficient equalizer.

In addition to the new model, which takes the place of an older model of similar type, there are three other cars



Left—Chicago electrics are built for the use of cushion tires exclusively; this shows model 152. Right—The Woods chassis has been considerably revamped and now has underslung worm drive, a unique springing system and a new motor support

in the Waverley line. These are a front-drive, four-passenger model at \$2,750, a rear-drive, four-passenger model at \$2,400 and a five-passenger forward-drive limousine at \$3,000.

RAUCH & LANG

In addition to continuing its four regular models, the Rauch & Lang Carriage Co., Cleveland, O., has developed three new models for the forthcoming season. These are Model TC5, \$4,000, a town car with 109-inch wheelbase, seats for four inside and two outside and the battery compartment ahead of the driver; Model TXC5, \$4,000, which is also styled a town car and is somewhat similar in appearance to TC5 except that there is no roof over the driver; and Model BX5, \$2,950, a brougham, with seats for three and 92-inch wheelbase; all three models have worm final drive.

The models that are continued are R5, a two-passenger open roadster at \$2,600; CR5, a closed roadster with seats for three, at \$2,800; B5, a conventional brougham, at \$2,950; and J5, a coach model with five seats, all facing forward, the price being \$3,100 with front or rear control, and \$3,200 with selective dual control. This model has 102-inch wheelbase; all the other carried-over models having 92 inches.

In the carried-over models the construction remains substantially the same except for a number of improvements designed to increase efficiency, and, consequently, mileage. The batteries have been refined, with the result that 25 per cent greater mileage is claimed, though no change has been made in the method of carrying the battery. The motor remains of the high-speed type, operating at about 2,500 r. p. m., and is direct connected to an overhung worm gear

through double universal joints, there being no intermediate reductions between the motor and the axle. A minor change has been made in the front axle to permit of a shorter turning radius.

The control method remains unchanged. All models except the new TC5 and TXC5, which have wheel steering with the controller mounted on the column, have lever steer with a vertical lever controller handle. The battery equipment consists of 41 cells of 11-plate Hy-Cap Exide in all models except TXC5 and TC5, which have 42 cells; Ironclad-Exide or Edison is furnished at an extra cost. In all models a special type of electric cord tires now is used and it is stated that as a result battery efficiency has been increased from 30 to 80 per cent.

STANDARD

A single coupe model, listing at \$1,990, will be marketed by the Standard Car Mfg. Co., Jackson, Mich. This is styled the Model M-4 and provides accommodations for three persons facing forward with an auxiliary seat for a fourth passenger. The body is finished with blue and black panels with either whipcord or broadcloth upholstery in gray or blue. The wheelbase is 96 inches and the tire equipment consists of 32 x 3½ pneumatic or 33 x 4 cushion tires, Motz tires being \$65 extra.

The motor is a Westinghouse series-wound machine carried in the center of the chassis and driving by shaft to a double reduction rear axle, the final gear ratio being 4 to 1. The battery is a 32-cell, 11-plate Exide Hy-Cap, with 12 cells in the rear and 20 cells in front. A drum-type controller gives six forward and three reverse speeds. The ampere-hour capacity is given as 137½ and the

mileage 60 to 75. Both sets of brakes are internal expanding on rear wheel drums. A channel steel frame is mounted on 36-inch front semi-elliptic springs and 48-inch rear three-quarter-elliptic members.

CHICAGO

The Walker Vehicle Co., Chicago, Ill., which has just taken over the Chicago Electric Car Co. and which will continue to produce the Chicago electric in conjunction with the Walker Balance-Drive commercial vehicles, is placing on the market three refined Chicago models, all of the limousine type; there are but two chassis, which are the same except in wheelbase. Two models are four-passenger rear drive vehicles and the third is a five-passenger front drive model.

Chicago cars have been designed for the use of solid tires exclusively and for this reason the selection of materials has been given careful consideration. The pressed steel frame is deep and wide, with the side members reinforced with eight heavy cross members integrally gusseted. The motor is a slow-speed, series-wound Westinghouse machine with direct drive through a straight line shaft and double universal joints to spiral bevel gears.

The controller is a Westinghouse-Chicago device of the continuous torque type with a magnetic blow-out, which practically eliminates arcing at the contacts. All five forward speeds are running speeds, there being no resistance units. Forty cells of 11-plate MV type Exide battery in high-ribbed jars with flexible copper connectors is standard equipment, 20 cells being at the rear and 20 at the front, with no portion of the battery directly over the axles. The braking system consists of 14 x 2½-inch

internal expanding brakes on rear wheel hubs, operated by pedal, and a 10-inch contracting band brake on the propeller shaft and operated by the control lever. The standard tire equipment consists of Firestone notch dual tread cushion tires, the size having been slightly increased; wire wheels with Goodrich Silvertown cord pneumatic tires are optional.

BROC

There are three Broc models in the line of the American Electric Car Co., Saginaw, Mich., and they are all mounted on the same chassis, with a wheelbase of 96 inches and either 34 x 4 cushion or pneumatic tires. The three models are a rear-drive brougham at \$3,100 for five passengers, a front-drive brougham, also for five passengers, at \$3,150, and a five-passenger double-drive brougham at \$3,200.

The drive system in the Broc models is somewhat similar to the system used in the Argo. The motor is a 54-volt series-wound Westinghouse machine, centrally suspended in the chassis, whence it drives by shaft to a double-reduction combination bevel and spur gear in a floating axle. The battery equipment is the same for all three cars and consists of 40 cells, of 11-plate Exide Hy-Cap, giving an ampere-hour capacity of 137½ and a mileage of from 75 to 95. In each case a drum-type controller, operated by lever, gives five speeds forward and five reverse.

The brake system is quite different in this model from the system in the Argo and Borland. There are two sets of brakes, one set being located on the drive shaft and operated by hand lever, and the other set being on rear wheel drums and operated by pedal. The former are external contracting and the latter internal expanding. The frame is a channel steel section, supported in front on semi-elliptic springs and in rear on three-quarter-elliptic springs attached above the axle.

BAILEY

Two chassis, mounting two bodies and differing only in passenger capacity, wheelbase and battery equipment, will constitute the line produced by S. R. Bailey & Co., Amesbury, Mass., for the forthcoming season. The first of these is a two-passenger roadster finished in English purple lake with black uphol-

stery at \$2,900, and the second is a four-passenger touring model with the same finish and selling at \$3,300. The former has a wheelbase of 112 inches and is mounted on 33 x 4 pneumatic tires, front and rear, and the latter has 132-inch wheelbase and is mounted on 34 x 4 pneumatic tires.

In both chassis the distinctive Bailey transmission system, which incorporates motor drive to a countershaft and thence by side chains to the road wheels, is retained practically without change. The motor is a series-wound General Electric machine, controlled through a drum-type controller with the lever mounted atop the steering wheel and giving six forward speeds and three reverse. The battery equipment is Edison exclusively and in the roadster consists of 60 cells, of A-5, with a rated ampere-hour capacity of 187.5 and giving a mileage of 100 at 20 miles per hour; the maximum speed is 25 miles per hour. In the touring model the same number of cells is used but the size is A-6, the ampere-hour capacity being 225.

Frames are wood, braced with steel, and are mounted in front on semi-elliptic and in rear on full-elliptic springs. There are two sets of brakes, the service set operating by pedal on the rear wheel drums and the emergency set operating by pedal on countershaft drums.

BEARDSLEY

The Beardsley Electric Car Co., Los Angeles, Cal., is marketing three models for the forthcoming season. These are a Victoria, at \$2,750; a five-passenger brougham, at \$3,000, and a three-passenger roadster, at \$2,600. All three bodies are mounted on the same chassis, which has a wheelbase of 103 inches, either cushion or pneumatic tires, 33 x 4, being fitted.

In the case of the roadster there are 42 cells of 13-plate Gould battery, mounted 60 per cent in front and 40 per cent at the rear; the ampere-hour capacity is 168 and a mileage of 90 per charge is given. The Victoria and brougham models have 36 cells of 15-plate Gould battery, equally divided front and rear. The ampere-hour capacity is 193 and these cars are capable of 75 miles, at 20 miles an hour, on one charge.

The motor is a 54-volt special series-wound Westinghouse machine, driving by shaft to bevel gears. The controller, of the drum type, is pedal-operated and gives five forward and five reverse speeds. The roadster model has a wheel

steering gear and in the other two there is a lever. Two sets of brakes are fitted on rear wheel drums, both mechanically operated. Springs are three-quarter elliptic in the rear and semi-elliptic in front, slung over the axles in both cases. One of the distinctive features of Beardsley cars is that wire wheels are used exclusively.

COLUMBIAN

Three models are being placed on the market by the Columbian Electric Vehicle Co., Detroit, Mich. The first of these is a two-passenger roadster, listing at \$950, the second, a three-passenger coupelet, selling for \$1,250, and the third, a four-passenger brougham, listing at \$1,450. All are mounted on the same chassis and in each case the standard body color is dark blue with silver gray whipcord upholstery.

Twenty-six cells of either Willard or Gould battery is standard equipment, though any other make will be supplied at extra cost, and these are divided into four trays, two trays of 12 cells being in front with the remainder in the rear. Each cell has 11 plates. The ampere-hour capacity is given as 135 and the average mileage per charge 75 to 85.

The motor, which operates normally at approximately 2,600 r. p. m., is mounted above the springs and beneath the body, where it is fully protected. The drive is direct by shaft to worm gearing in a pressed steel semi-floating axle. The front axle is tubular. Steering is effected by lever, and a drum-type controller gives five forward speeds and two reverse, the controller handle being at the rear seat. There are two sets of pedal-operated brakes, both operating on rear axle drums. The frame is a channel steel section carried both front and rear on the conventional cantilever springs. The wheelbase is 98 inches on 30 x 3½-inch front tires and 31 x 4-inch rear tires, the tread being standard.

OHIO

There has been little mechanical change made in the four models which go to make up the line of the Ohio Electric Car Co., Toledo, O., though bodies have been very thoroughly revised. Fenders now are arched and made entirely by hand from one piece of aluminum and in the closed cars the top has been rounded over into the back.

As heretofore, the motor is a specially designed type and drives direct by shaft to either worm or spiral bevel gears; one of the ingenious features of the transmission unit is that the torsion tube is supported between the motor and the rear axle at a point close to the center, the purpose of the construction being to minimize the unsprung weight and thus increase efficiency. It is pointed out that in the Ohio there is unsprung weight only at the front axle.

The control method is distinctive, though it has not been materially changed. There is a small hard rubber cylinder mounted at the top of the steering lever. Rotation of the cylinder controls a magnetic controller, there being four forward speeds and three reverse. The standard battery equipment in Models 21, open roadster, and 41, coupe, is 42 cells of 11 plates; in Models 51 and 61, which are closed cars, 44 cells are used.

The wheelbase of all models is 98 inches, the roadster being equipped with 34 x 4½ electric pneumatic tires or 36 x 4 cushion. The other models have the same electric pneumatics or they may be equipped with 36 x 4½ cushion.

GRINNELL

The Grinnell Electric Car Co., Detroit, Mich., is continuing both its Model R French brougham, which incorporates the distinctive Grinnell one-unit transfer control system, and the Model S coupe, in which all four passengers face forward; the former lists at \$3,400 and the latter at \$3,000, both being finished in blue with gray bedford cord upholstery. Except for a difference in wheelbase lengths, the size of tires and battery, chassis are identical.

The dual drive model, in which a single set of control levers is used from either the front seat or the rear seat, pivoting from one bearing at the lower end, is equipped with 40 cells, of 17-plate Philadelphia battery evenly divided between front and rear compartments. The coupe model, however, has 40 cells, of 15-plate thin type Grinnell battery, the mileage per charge being given as 80. In both a drum-type controller gives five forward and three reverse speeds.

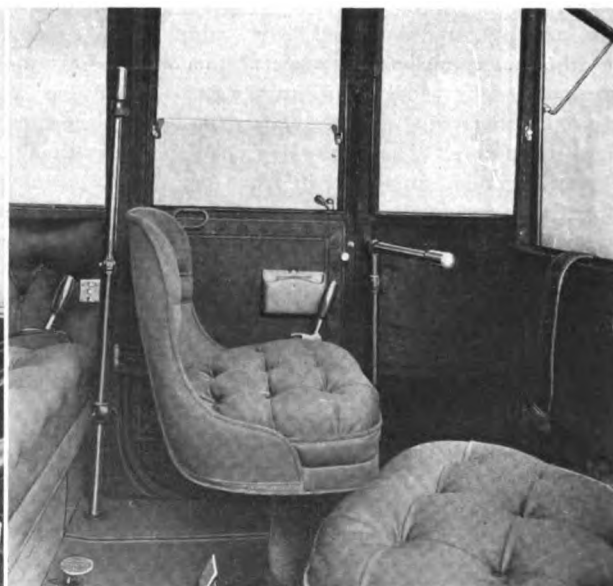
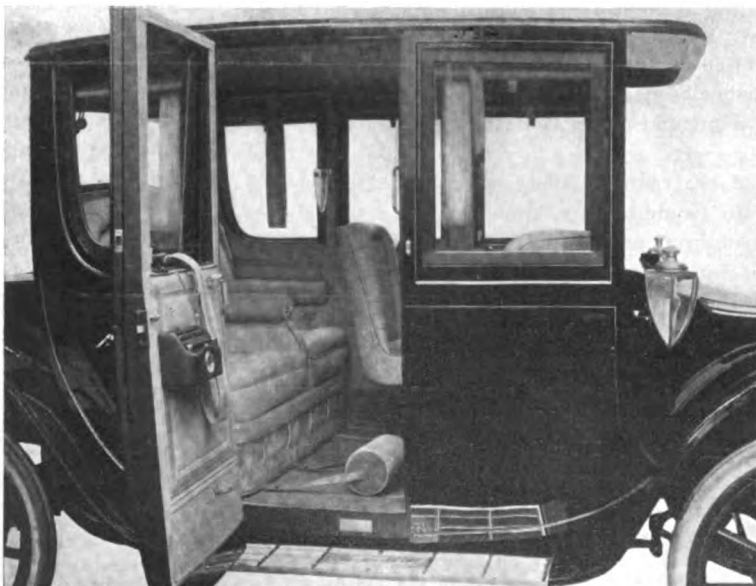
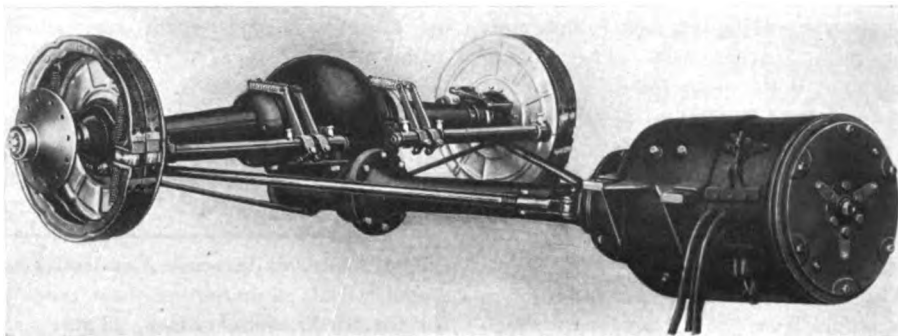
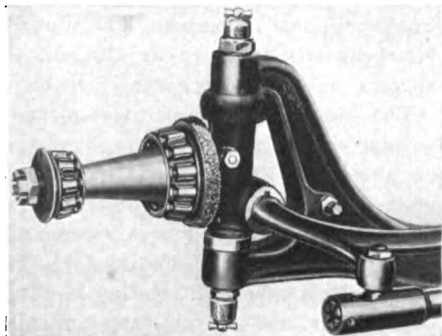
The motor, which bears the Grinnell nameplate, is mounted in the center of

the chassis, whence it drives direct by shaft and two universal joints to the axle. A channel steel frame is mounted on 42-inch front and rear full-elliptic springs in the case of the dual control model.

FLANDERS

The Flanders Electric Co., Pontiac, Mich., is producing a single four-passenger Colonial coupe model finished in blue with whipcord or broadcloth upholstery and selling for \$1,750.

From the motor, drive is direct by shaft to a worm axle with a final reduction of 9.8 to 1. Energy is furnished by a Willard battery disposed in six trays of five cells each, 10 at the rear and 20 in front; each cell has 11 plates and the ampere-hour capacity is given as 135, the mileage per charge being 75. The motor is a compound-wound Wagner, which is mounted directly on the rear axle and drives through an extremely short shaft. The steering gear is lever-operated and a second lever operates a six-speed drum controller.



Upper left—Front steering spindle and mounting of Detroit electric. Right—Underslung worm, enclosed shaft and motor mounting of Detroit electric. Lower left—Luxury is the keynote of model 108 Waverley limousine. Right—Control mechanism of the Waverley double-drive model.



Electric



Starters & Generators

GREATER simplicity and refinement of details mark the starting and lighting equipment for 1915. These two qualities are evidenced in a multitude of ways. In the first place, two makers of separate starting and lighting units have announced machines of the motor-generator type.

Increasing Simplicity

These machines are made by the Bijur and Westinghouse companies and both use compound field windings. This type of instrument is simplicity itself, both electrically and mechanically. There is only one drive from the crankshaft, the ratio generally being in the neighborhood of 3 to 1, and there are no electrical parts other than a low-voltage cutout to prevent the battery from discharging through the armature at low speeds. The motor-generator design is a popular one for 1915, Splitdorf, North East, Remy and Delco also making outfits of this type.

Simplicity is also noted in the new

Gray & Davis generator design in which the constant-speed governor-controlled generator gives place to a variable-speed machine with inherent voltage regulation in the field. A new starter drive brought out by Bijur, in which the gear which meshes with teeth in the flywheel is keyed solidly to the shaft, also has a reduced number of parts. Since the over-running clutch has been discarded in this design, the armature is made to stand the excessive speed to which it may be subjected.

Refinement and simplicity are distinctly perceptible in the exterior appearance of almost every model. There is hardly one that is not better appearing; lines have been improved and exterior details simplified so that the 1914 machine is a much better appearing mechanical job than its predecessor.

Greater Durability

Refinement in the wiring and insulation has reduced the current losses and increased the life of the machine in many

cases, so that the electrical end may be said to be more durable on the whole.

The 6- and 12-volt controversy is still undecided, although the former is more popular. Practically all the makers are ready to make either 6- or 12-volt systems, according to the dictates of the automobile manufacturer, and several companies make both as stock.

Single and double wiring systems have held their own during the past year and most manufacturers stand ready to furnish equipment for either method of wiring.

Flywheel Connection Popular

Methods of drive are also left to the automobile manufacturer largely. Where two unit systems are in vogue, the flywheel drive for motor and drive of the generator from the magneto shaft are most common.

The new machines have on the whole been improved in torque, weight has been reduced, accessibility decidedly improved, and the overall dimensions reduced.

GRAY & DAVIS

Two starting motors and two lighting generators incorporating many new features have been listed by Gray & Davis, Boston, Mass. The most important change is in the lighting generators, which are of the variable-speed type. Both generators and motors have been reduced in size, the accessibility improved and detail mechanical and electrical changes made.

The two types of lighting generators are designated T and S, the T rated to give a current output of 10 amperes at 6.5 volts and 1,000 r. p. m. and the S giving 10 amperes at 6.5 volts and 650 r. p. m.

A most important generator change is the method of voltage regulation. In the 1914 machines voltage regulation was by maintaining the speed of the armature constant by a centrifugal governor. In the new machine there is a combined regulator and cutout which rests on the

top of the generator and which not only maintains the voltage constant regardless of speed variation but also breaks the circuit when the speed of the generator drops so low that the voltage generated is less than that of the battery.

The new machines have a rectangular or magnet-shaped frame which is constructed of one flat piece of low carbon steel formed into U shape. This change in frame construction gives greater ruggedness, is more compact, allows more accurate alignment of the bearings and the number of parts is materially reduced. Magnetic leakage is also avoided, it is claimed.

The type T generator gives a 6.5-volt, 10-ampere current at 1,000 r. p. m., is intended for four-cylinder cars, and is designed to run at approximately two and one-half times crankshaft speed, or, in short, to be driven at its rated speed at a car speed of 10 miles per hour, the car on high gear.

The type S generator is for six-cylinder

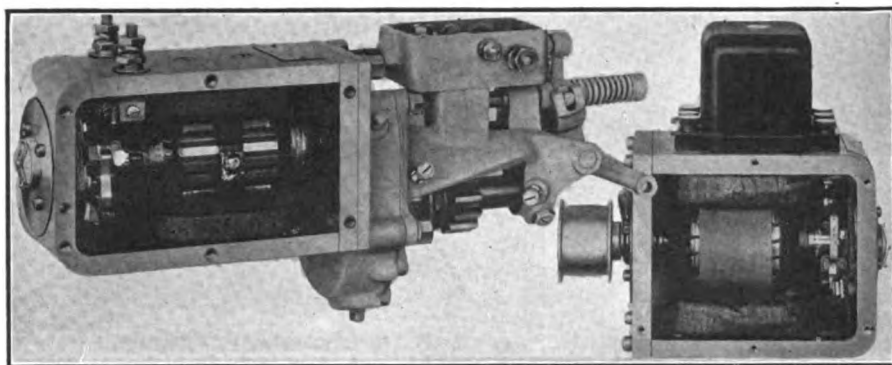
machines and is to be driven directly from the magneto shaft at one and one-half crankshaft speed. This gearing allows the generator to run at its rated speed of 650 r. p. m. when the car is driven 10 to 12 miles per hour.

The generators are similar in appearance to the type Y starting motor, being of the longitudinal-yoke design. This construction has enabled the production of the same current at the same speed as heretofore but with a smaller and lighter machine.

The type T generator complete with regulator cutout weighs 20.5 pounds, a reduction of 6.5 pounds. It measures 4.13 x 5.34 x 8.62 inches, and the G-1 generator, which it replaces, measured 5.5 x 6 x 11.57 inches.

Likewise the new type S generator, which takes the place of the type E, has been reduced 1.25 pounds in weight and in the dimensions reduced from 5.5 x 6 x 12.5 to 4.63 x 5.97 x 10.75 inches.

The type Y starting motor, which is an entirely new design, will be standard



Gray & Davis Y motor, type 4-50 for open flywheel installation, showing mechanism. Right—Type T dynamo showing square, compact appearance, wiring and commutator

equipment for all except the largest cars. This motor is a new design and is rated at 6 volts, 100 amperes at 2,800 r. p. m. Cars with motors of extreme size will use the type H-1 motor, which was a standard model this year and carries its full load at 1,500 r. p. m., at which time it draws a current of 150 amperes. It operates only on the 6-volt circuit.

Mechanical improvements in the starting motor have been directed chiefly towards accessibility and ease of inspection of parts and to the refinement of details to give greater strength. For accessibility, the new Y motor has the longitudinal type of field yokes, which readily permit access to the interior of the motor by the removal of the cover plate from the side. The entire interior mechanism can be reached by removing these side cover plates.

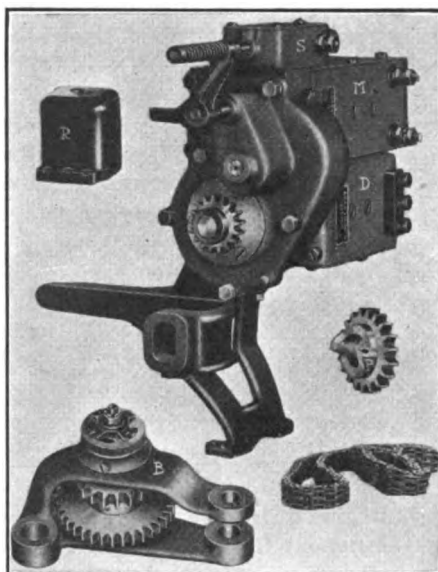
Torque Greatly Increased

Electrical improvements in the Y motor have greatly increased the torque as compared with the type K motor, and it weighs only two-thirds as much, the new motor weighing 19.75 pounds and the old one 31 pounds. While the type K motor was rated to develop normal load at 3,600 r. p. m. with a current draw of 100 amperes, type Y develops the same torque with the same current consumption at 2,800 r. p. m. The type Y motor is 4.312 x 4.72 x 8.16 inches. These dimensions compare favorably with the K motor which was 5.75 inches in diameter and 8.875 inches long.

For 1915 the flywheel drive will be standard. The speed reducing gears and starting switches are integral with the motor casing and arranged so that a single movement of the starting pedal simultaneously meshes the sliding pinion with the flywheel gear and closes the starting switch.

Cranking speeds vary according to the motor, but the following table showing the speeds of various sizes of motors will give a very general conception of them:

No.	Cylinders	Bore	Stroke	Crank.	Speed
4		2.87	4		210
4		3.5	5		132
4		3.75	5		124
4		4.12	4.5		135
6		3.38	5		108
6		3.75	5.5		104



Gray & Davis Ford set showing D, dynamo, M, motor, S, switch, P, pinion, R, regulator, and B, gear

Under normal conditions the draw on the battery varies from 65 to 100 amperes. Under adverse conditions, such as

a cold motor and a chilled battery, the initial kick may be as high as two and one-half times the normal running current, but this maximum draft is only for a fraction of a second.

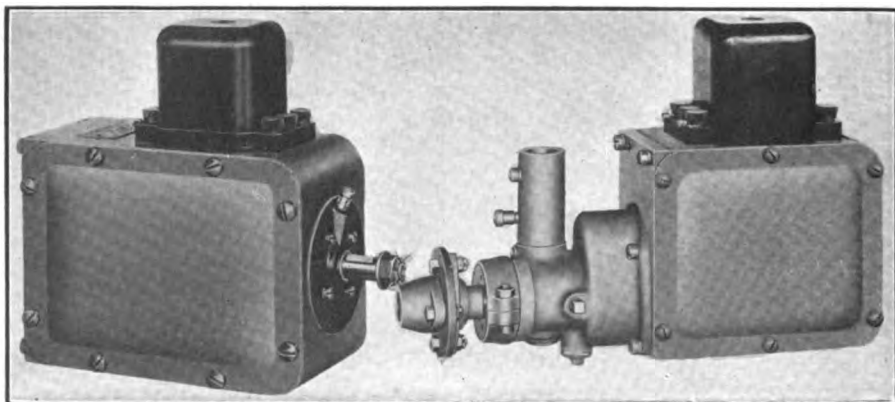
In all Gray & Davis systems the starting and lighting machines are separate units, although in the special system recently brought out for Ford cars these two are mounted one above the other in a single case. Only 6-volt systems are built and the single wire is standard construction.

Single-Unit Ford System

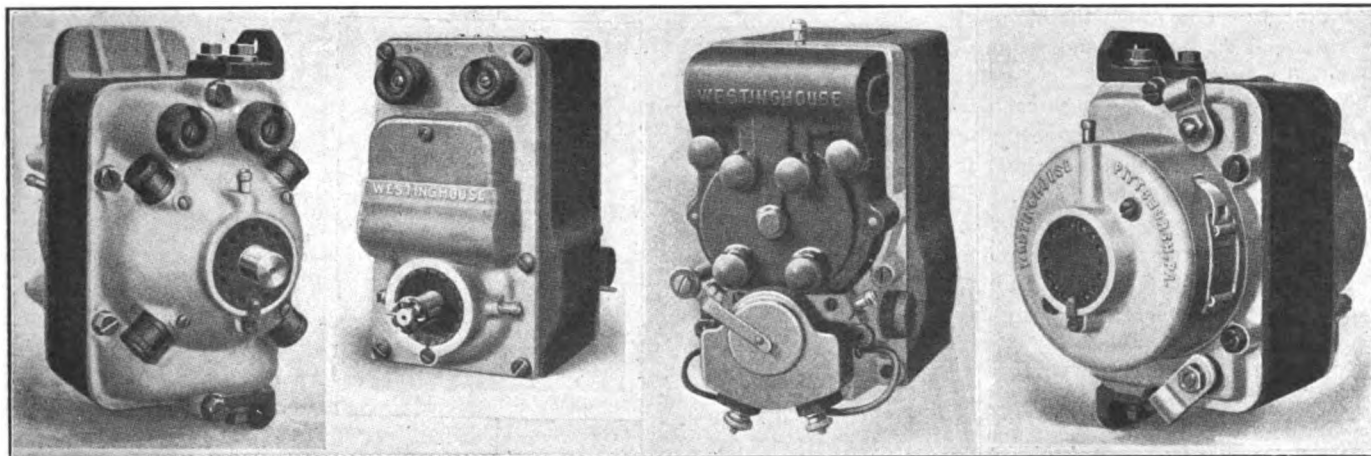
A brand new Ford starting and lighting system has been brought out by Gray & Davis, Boston, Mass. It is a single-unit system of the motor-generator type and is distinct from the two-unit system which was announced a few weeks ago. Besides the motor-generator the outfit includes a six-volt battery box, indicator for dash, regulator cut-out, switches, wiring and all necessary connections. The engagement of the crankshaft is by means of a silent chain, which is neatly housed, thereby preventing dust and dirt from coming in contact with it, quiet running and perfect lubrication being assured by this housing. The new system is easily installed. It is mounted on the left side of the motor in the same position that the double-unit Gray & Davis Ford system is installed. The radiator is removed and a driving sprocket is placed on the crankshaft. The price of this outfit complete is \$75.

WESTINGHOUSE

Three new starting motors will be made by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for 1915. These are a 12-volt motor-generator, of $\frac{1}{2}$ horsepower, a 1-horsepower, 12-volt motor, and a $\frac{3}{8}$ -horsepower, 6-volt starting motor. The motor-generator is a new departure in Westinghouse practice,



Left—Gray & Davis type S dynamo which has combination regulator and cut-out mounted atop the casing. Right—Dynamo with geared head and vertical ignition timer



WESTINGHOUSE APPARATUS—Left to right—No. 520 lighting generator; rear view of No. 208 lighting generator; No. 246 combined ignition and lighting generator; No. 502 starting motor

separate starting motors and lighting generators having been made heretofore. The $\frac{1}{2}$ -, $\frac{3}{8}$ - and $\frac{3}{4}$ -horsepower, 6-volt models will be continued. Lighting generators for both four- and six-cylinder machines, with and without ignition, will also be continued.

The new motor-generator is designed especially for small cars and is positively driven from the crankshaft by a chain or gear, the ratio being 2.5 to 3 to 1.

Improvements in the line consist mainly in refinements in insulating, lubrication and assembly. No changes have been made in the size or torque of the motors, but 10 per cent current increase has been obtained in the generators. Both 6- and 12-volt systems are produced, but the former is preferred. An important feature is that either 6- or 12-volt instruments may be had in the same machine frames. Single wires are used almost exclusively, but double wiring will be furnished when specified.

Magnetic Motor Connection

Starter drive may be by chain from the crankshaft, by gearing manually controlled and operating through the gear-set, or by flywheel drive, in which case the meshing of the gears may be by hand, by magnetic control and automatic screw pinion shaft. The latter method is new.

Westinghouse motors are rectangular in shape and entirely enclosed. The shape makes them easy to locate and gives a rigid mounting. They are of the four-pole, series-wound type, the field winding being placed on two of the four poles. This type of motor has a high starting torque.

Generators are designed to operate at magneto shaft speed; that is, at engine speed on four-cylinder cars and one and one-half crankshaft speed on six-cylinder cars. The center line of the armature

is the same as the magneto standard.

An automatic cutout is provided inside the generator which breaks the circuit when the generated voltage falls below that of the battery. The switch is so adjusted that it disconnects the generator at a speed 25 to 30 per cent lower than the cut-in speed. This prevents the switch operating continuously at the speed at which the switch closes the circuit.

When the generator is connected to the battery by the automatic switch, the current rises rapidly with the speed until a moderate speed is attained. Above this value the charging current rises slowly as the speed increases, but does not reach an excessive value. This regulating fea-

ture is secured by connecting the battery through a reversed compound field winding.

Current for the lights does not pass through the compound field winding, however, and when the lights are turned on the output of the generator automatically increases to supply them. With the usual lamp equipment this increase in generator capacity is sufficient to operate the lamps without demand on the battery at ordinary running speeds. At low speeds the battery supplies a certain proportion of the lighting current and when the engine is not running the battery supplies the entire demand.

Dual Ignition System

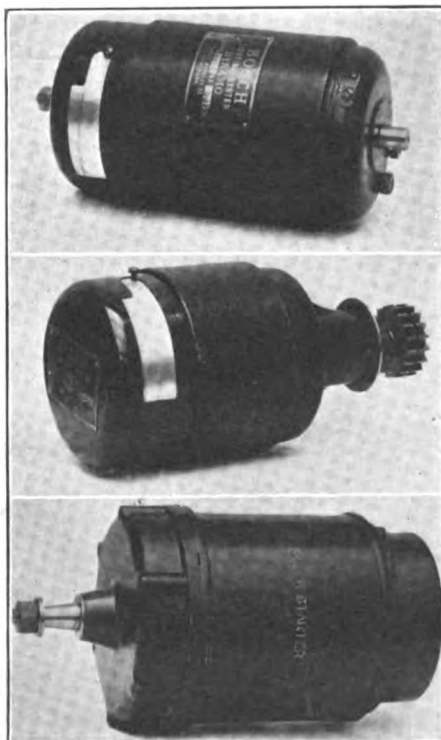
Dual ignition is obtained in the Westinghouse system; that is, the battery is an independent source of supply, as well as the generator operating with the battery, while the interrupter, ignition coil and distributor are common to both.

Automatic spark advance is a feature of the system, the advance working over a range of 45 degrees. Provision is made for manual operation also, and it is recommended that the spark lever be connected but ordinarily it will not be needed.

BOSCH

Four sizes of motors and two types of generators in sizes to suit the individual needs of the car manufacturer are manufactured by the Bosch Magneto Co., New York City, for 1915.

Practically no changes have been made in any of the models and they may be considered continuations of the 1914 series. The latest addition is the Model D starting motor, announced some months ago and intended for cars with rather small motors, as it weighs only



BOSCH APPARATUS—Upper—Large lighting unit. Center—Small lighting unit. Lower—Type S 63 Bosch starting motor

19.75 pounds. The other three models are known as A, B, and C and weigh 62, 48 and 30 pounds.

Both starting and lighting machines are built in both 6- and 12-volt sizes, and with single- or double-wiring, according to the manufacturer's specifications.

Standard motor drive is by a pinion on the armature shaft meshing with a gear ring on the flywheel. This ring may be attached to the flywheel or the teeth may be cut in the flywheel rim.

There are two types of lighting generators, one a constant-voltage design, the other a combination of constant current and constant voltage. Both of these models are manufactured in capacities to suit individual manufacturers and for 6- or 12-volts.

Constant Voltage Design

The constant-voltage design employs an electro-magnetic system of regulation in which the strength of the field is reduced as the speed increases, and thus the voltage is maintained at its rated value.

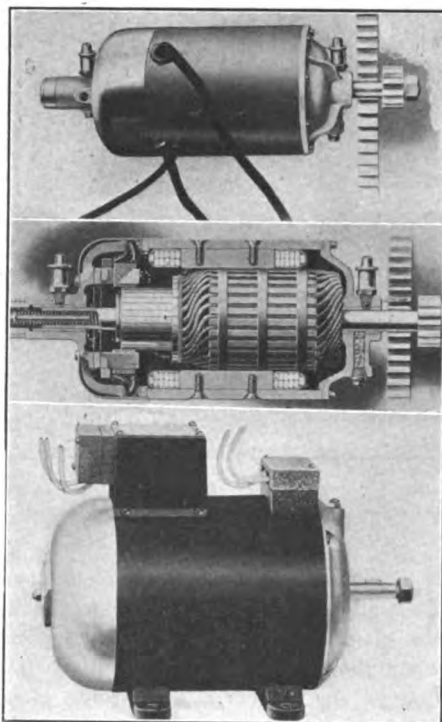
The constant-current-and-voltage machine uses bucking coil current regulation, which is merely a series coil which opposes the shunt field coil. In parallel with this series coil is a ballast coil. Any increase in amperage causes a rise in the resistance of the ballast coil, which allows a greater current to flow through the bucking coil; the field set up by the bucking coil opposes that of the main shunt field coil and the net field strength is reduced and the voltage and current maintained at a constant value.

KEMCO

The Kemco line has been enlarged so that it now includes starting motors and generator of different types as well as the original fan generator which is associated with the Kemco name. The six-volt system is used throughout. The complete line consists of four starting motors of graded sizes for different powered motors. These are especially for manufacturers and may be procured with the Bendix drive or a silent chain drive or gear-drive with overrunning clutch. There is a universal starting motor which is designed especially for cars already in use. It is mounted in front of the radiator, taking the place of the starting crank. The reduction gears are contained in the starter casing.

Kemco Ford Outfit

A smaller addition of this model is made especially for Ford cars and is



BOSCH APPARATUS—Upper—Rushmore starter showing drive. Center—Rushmore starting motor in section. Lower—Rushmore generator

used in connection with the fan generator to make a complete starting and lighting system. A. Willard L. B. A. storage battery is part of the equipment. The starting switch is a foot-button type. In addition to these units, lamps, wiring and complete fittings are supplied with this system, the price for the whole outfit being \$110. There is an automatic cut-out to protect the battery from discharging through the generator when the motor is operating at low speed. The electric headlights are black enameled with brass or nickel trimmings and are fitted with two sets of bulbs, one for country and one for city driving. There is a tail light to match. Terminals, connectors, screws, staples, bolts, nuts; in fact, everything that is needed to make the installation is included.

Separate generators of 10- and 15-ampere capacity are also offered. These machines differ from former Kemco practice in that they are entirely separate from the fan. Voltage regulation is by means of a Ward-Leonard combined regulator and cut-out. This is a vibrating type of regulator. Another generator is a belt-driven type which resembles the original fan generator minus the blades. This machine has a magnetic system of voltage regulation. These machines are made by the Kemco Electric Mfg. Co., 2229 Ashland road, Cleveland, O.

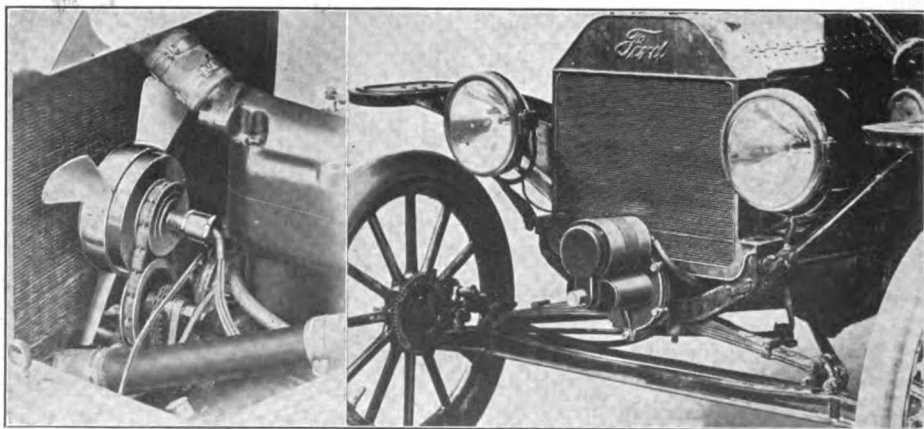
AUTO-LITE

Auto-Lite cranking and lighting systems, which are of the two-unit type, admit of much variation in the methods of application and may be accommodated to almost any amount of space. In order to make this possible, the motor unit is made in two sizes, one longer and of less width than the other. There are two sizes of generators, so that it should be possible to get one of dimensions to fit in the space available.

The Auto-Lite system operates on 6 volts, and besides the two main units consists essentially of a circuit breaker, foot switch, lighting switch, ammeter and storage battery. The Auto-Lite company also makes a form of its apparatus in which an ignition distributor is a part of the generator, the system then caring for all electrical functions.

Auto-Lite Completely Enclosed

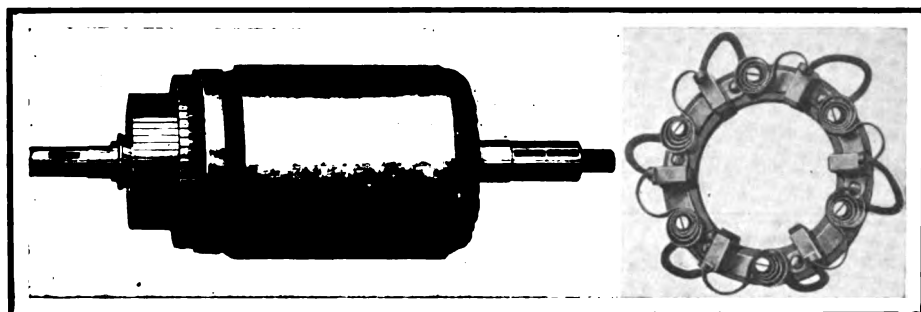
The Model M cranking motor is a series-wound type of high torque, it is said. It is compact, the length being $8\frac{3}{4}$ inches, width $5\frac{1}{2}$ inches, and the weight $36\frac{1}{2}$ pounds. The entire machine is compactly enclosed in cast iron, which protects all parts from dust and water. By removal of the nameplate band the brushes and commutator are



The Kemco Ford system consists of a combined fan and generator and a starting motor which attaches to the crankshaft in front of the radiator

readily accessible. This motor will crank a six-cylinder engine having 60 pounds per square inch compression pressure at 100 r. p. m., using under 95 amperes, it is stated. It is so constructed that it can be applied to the car in either a vertical or horizontal position, and can be connected either to the crankshaft through a train of gears or a chain, or to the flywheel direct by having its pinion mesh with the teeth of the periphery. It can also have a transmission application.

an hour. The output increases until at about 17½ miles an hour the production is 12 amperes. At this point the reversed series winding holds the output no matter how much faster the car travels. The generator operates at engine speed and can be driven in any convenient manner. It can be placed on a bracket just ahead of the magneto and connected directly to the magneto shaft by a simple coupling, the company points out. It weighs 37½ pounds and measures 10 x 4¾ inches over all.



The Simms-Huff armature is drum-wound, but the wires are thoroughly protected. The brush holders are connected to two metallic rings with but a single wire to the field

Though designed for exactly the same work as Model M, the other Auto-Lite motor, Model MC, differs in construction and shape. It is 7½ inches long by 6¾ inches wide, and weighs 30 pounds. A cast-iron frame and field are used, and the series winding is also present. Removal of the nameplates on the end gives access to the four brushes. This motor can also be adapted to any desired position. It is said to be capable of driving a 4½ x 5, four-cylinder engine of 60 pounds per square inch compression pressure at 185 r. p. m. The usual gear reduction is about 25 to 1. In the Auto-Lite application, an over-running clutch is interposed in the drive which disconnects the electric motor when the gasoline motor starts under its own power.

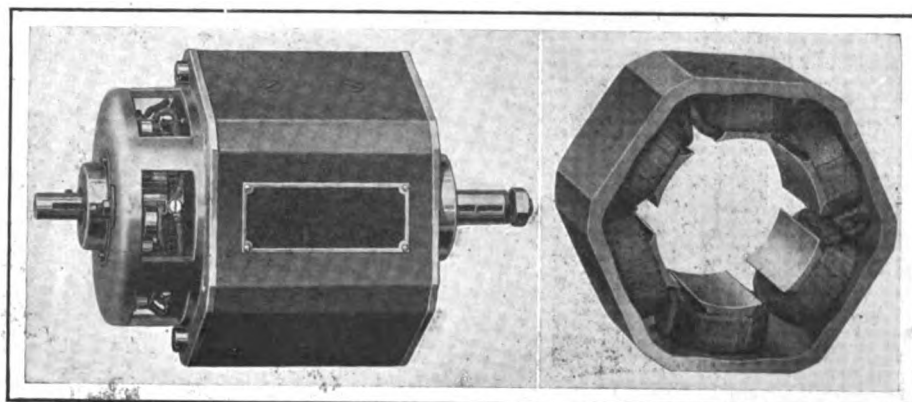
Reversed Winding Regulation

The three Auto-Lite generators are designated as Model G, Type SR4; Model G, Type VR4; Model GC, and Model GB. The first two are identical except that VR4 has the ignition distributor as a part of it. Model GC is adaptable to the same work as the SR4, but is of a different shape. Model GB has been brought out to meet the needs of the small types of cars.

Type SR4 generator is of the excited field type, in which the current output is regulated by reversed windings on the field, which serves to cut down the current produced by weakening the field. The generator begins to charge at an engine speed of 200 r. p. m., which corresponds to a car speed of about 5 miles

The Model GC generator is designed to be driven by either a chain, train of gears or a V-belt. It runs at 2½ times engine speed, has a maximum output of 14 amperes, and begins to charge at under 7 miles an hour, while 10 amperes is the output at about 12 miles an hour. The current control is the same as that of the generator described above; that is, by a reversed series coil. The machine's compactness may be realized from its dimensions. The length is 8 inches, width 4 inches, and height 6¼ inches.

With the aim of keeping weight and size to the minimum, the small car generator has been developed with a 6½-inch length and 4¼-inch width, and its weight is 13 pounds. It produces 6 amperes at its maximum, and is driven by a silent chain from either the pump, magneto or crankshaft at 2½ times engine speed. It operates efficiently with a 40-ampere-hour storage battery.



The single unit is hexagonal in shape, facilitating attachment to any motor; brushes and holder are accessible by removing a metal end plate; the frame is pressed steel

SIMMS-HUFF

A single-unit motor-generator, combining all the functions of electric lighting and engine starting, is being produced by the Simms Magneto Co., East Orange, N. J., under the designation Simms-Huff.

The unit is exceptionally compact yet accessibility has in no wise been sacrificed. All of the mechanism which it is necessary to have accessible—the brushes and brush holders—is exposed by the removal of a single light metal casing which slips over the end.

The generator drive is by belt, this being one of the features of the system, and upon which reliance is placed for governing the speed of the armature. As a starting motor the unit operates at 12 volts; the lighting circuit operates at 6 volts.

Cumulative Compound Motor

In starting the engine the motor-generator draws current from a storage battery which is split into halves of six volts connected in series. The unit then operates as a cumulative compound motor, there being two field windings, shunt and series, thus providing maximum torque. Though the unit weighs but 36 pounds the lock torque is given as 24 foot pounds.

When the engine is running the unit automatically becomes a generator, driven by belt, and delivers 10 to 15 amperes to the battery at 6 volts pressure, the halves of the battery being connected in parallel. The regulation of the unit is an inherent feature, the winding being what is styled differential compound. That is, there are two windings which oppose each other so that the terminal voltage and consequently the charging current is not excessive at the higher speeds. At the same time, this winding operates to steady the load upon the engine.

The current output of the generator is

regulated entirely by the tension on the driving belt. A tight belt will increase the armature speed, thus increasing output and conversely a loose belt will decrease speed and output. A relative rate of charging would be from 8 to 15 amperes at 12 to 18 miles an hour car speed. If an ammeter registers less than 8 amperes at 12 miles an hour this indicates that the belt should be slightly tightened, a means for this process being provided in a slotted segment and set bolt on the fan support. It is pointed out that this method of regulation offers advantages in that the charging rate can be changed at will to correspond to winter or summer driving and to the draw upon the battery for lighting.

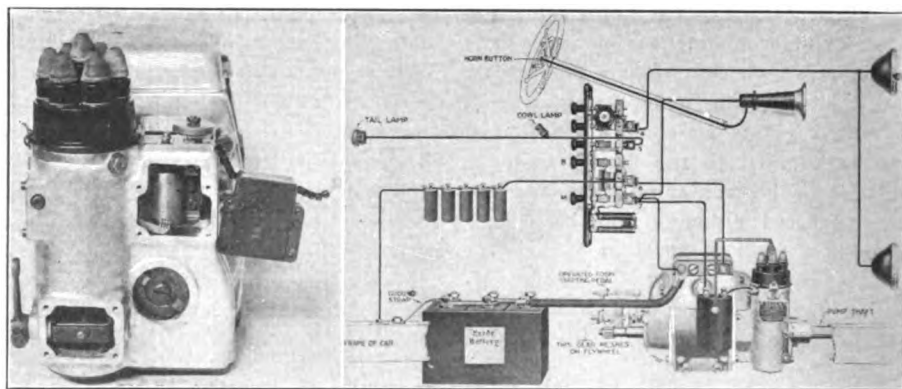
Automatic Starting Switch

The starting switch is arranged automatically to make the necessary series connections at the battery for starting and the parallel connection for charging. In addition, there are two terminals which may be used for a battery circuit in the event that dual ignition is used.

The brush holding mechanism is unusual in that all wires with the exception of one have been eliminated. This has been accomplished by connecting each set of three brushes to a metallic ring, one of which is a permanent ground and the other, which is the single wire connection, going to the field winding. Thus, six wires have been done away with.

The winding of the armature is another feature that is different from conventional practice. Though the armature is of the drum-wound type, the winding is passed through circular holes punched in the core laminations.

The system, which now is being used only by the Maxwell company, which is taking between 175 and 200 complete units per day, may be readily adapted to almost any other car. No specific wir-



The complete Delco electric lighting, engine starting and ignition unit and a perspective view of the various wiring connections

ing scheme is advocated, the choice of single or double wiring being left entirely with the car maker.

APELCO

A newcomer on the 1915 market is the Splitdorf-Apleco single-unit starting and lighting system, an output of the Apple Electric Co., formerly of Dayton, O., but now controlled by the Splitdorf Electric Co., in one plant in Newark, N. J. Three different sizes are made, known as Models A-25, A-27 and A-28, all of the motor-generator type. The outfit is furnished as a straight 12-volt design or 12-volts for starting and 6-volts for lighting, as may be desired by the maker.

The new models bear no resemblance to previous designs of either Splitdorf or Apple. The new machines are rectangular in shape and have a very smooth and neat exterior. The armature is driven from the crankshaft by silent chain. No gears or clutches are used and the armature is the only revolving part. The total speed reduction is provided by the chain.

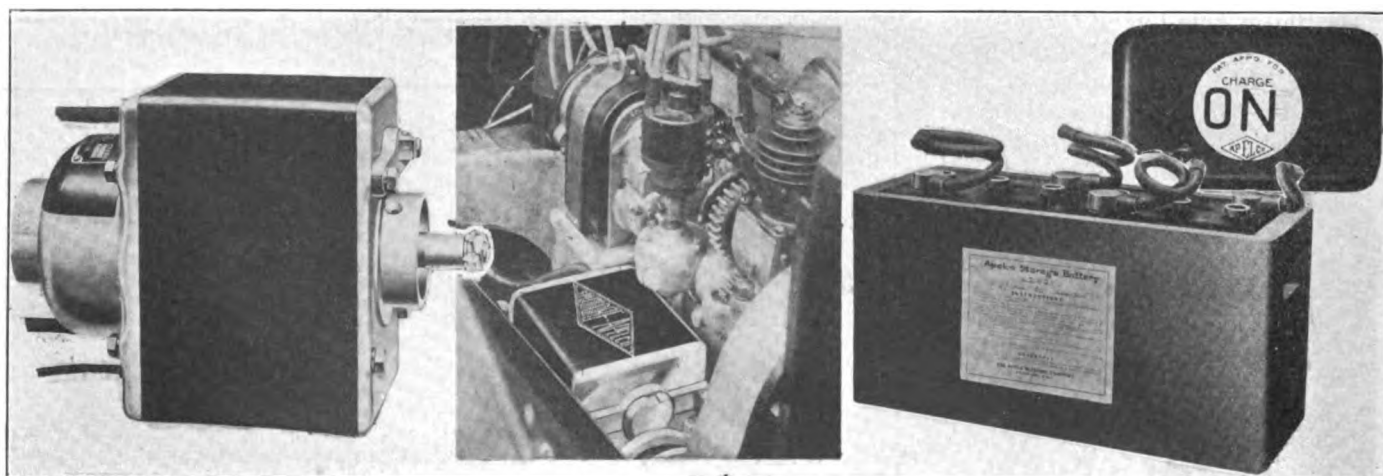
In the new equipment lighter weight

and smaller dimensions are noted. One model of motor-generator now weighs 49 pounds instead of 75. Nevertheless the new motor cranks the engine at a much higher speed than formerly, due to refinements.

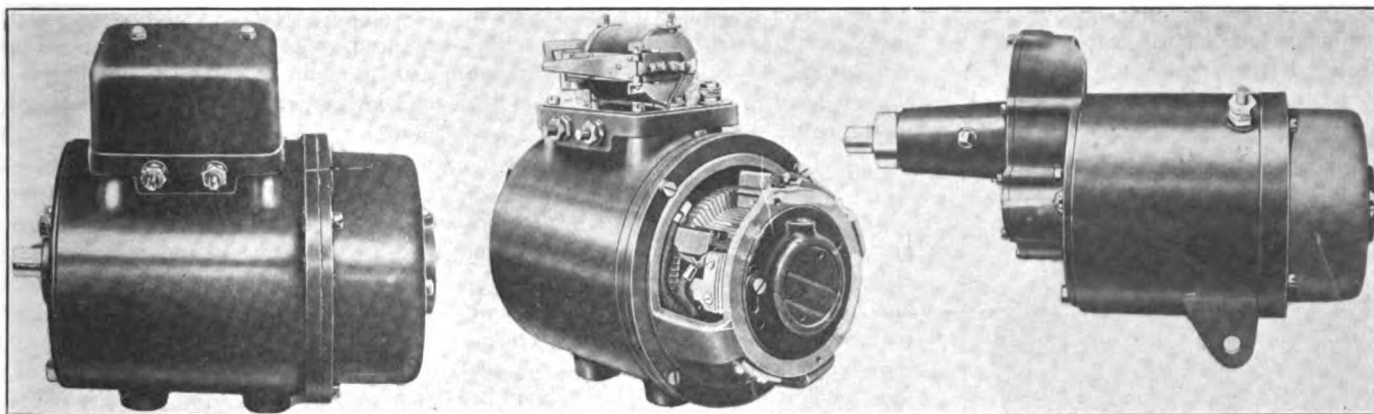
High Starting Torque

The motor-generator is a compound-wound machine in which the series and shunt fields add their magnetic strength together when the machine is operating as a motor, thus giving a maximum starting torque; but when the machine is running as a generator the current flow through the series field is naturally in the reverse direction, and therefore the series field flux opposes that of the shunt field and the net flux is the difference of the two. By this arrangement, as the speed of the motor-generator increases the voltage remains practically constant above an armature speed of 1,450 r. p. m.

By connecting the motor-generator across the terminals of the battery through closing the starting switch it acts as a motor and spins the engine until it starts, the cranking speed varying from 150 to 250 r. p. m. As soon as the engine rises to normal speed the



Left—Splitdorf-Apelco lighting and engine starting unit. Center—The unit as it appears in place on a motor. Right—The battery that is part of the equipment, and the dashboard indicating instrument



Two of the units that go to make up the Wagner lighting and starting outfit—the generator at the left, the generator with regulator and commutator exposed in the center, and the starting motor at the right

voltage is sufficient to charge the battery.

An automatic indicating switch connects between the generator and the battery when the former is driven at sufficient speed to charge the latter and likewise when the speed drops the connection is broken, so that there can be no discharge of current from the battery back into the generator. The indicator is equipped with a dial which shows the lettering "charge on" and "charge off," according to whether the battery is being charged or not.

LEECE-NEVILLE

Ten different models of motors, six models of motor-generators and three models of generators comprise the offering of the Leece-Neville Co., Cleveland, O., for 1915. Units are built for 6, 12 and 24 volts, and for double wiring.

The motor-generator is a new design and is made in two sizes. It is designed for motors of $2\frac{3}{4} \times 4$ inches and up.

Improvements in the starting motor are mainly in a more rugged construction of the inner parts and a reduction in weight and size. For example, one model has been reduced in weight from 38 to 27 pounds and in size from $11 \times 4\frac{5}{8} \times 7.44$ inches to $10 \times 5.13 \times 5.5$ inches.

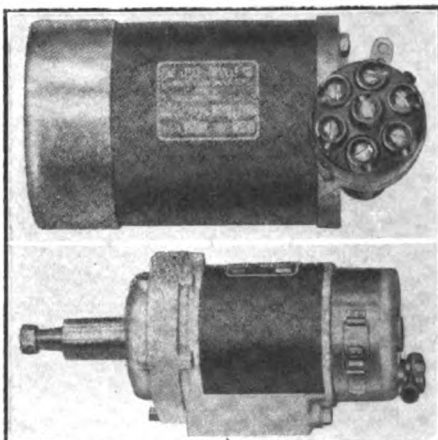
Four types of drive are offered: By clash gear meshing with flywheel; magnetically shifted flywheel drive; clutch sprocket and chain drive and automatic screw shaft and gear drive. The cranking speed varies from 100 to 275 r. p. m. The current draw for a $3\frac{1}{2} \times 5$ motor averages 80 amperes and the maximum is 125 amperes.

Three methods of regulation are used: Third brush regulation; field interrupter system, and bucking coil. The first is the most common.

A typical outfit made by the Leece-

Neville Co., Cleveland, O., is that found on the 1915 Haynes sixes. Generator and ignition are combined, and the starter is a separate unit.

When the armature speed reaches 350 r. p. m. the generated voltage is sufficient to close the cutout. The voltage is controlled by reaction so that the



Upper—Leece-Neville combined generator and ignition unit. Lower—the starting motor

maximum current, which is 15 amperes at 7.5 volts, is attained at a speed of approximately 15 miles per hour. The generator continues to charge the battery until a car speed of 5 miles per hour is reached.

The starting motor is a series type, which is connected to the crankshaft by means of a roller chain and an over-running clutch.

DELCO

Delco equipment for 1915 is slightly more simplified and lighter. It is a single-unit one consisting of starting motor, generator and timer and distributor. Each installation is a special design and there are no stock models. The 6-volt, single-wire system is standard.

The generating characteristics have

been changed so that the maximum output is reached between 15 and 18 miles per hour. In general current regulation is obtained by a field rheostat. A special resistance wire is wound on a spool of non-inflammable material and mounted in the distributor housing back of the condenser. The regulation is effected by an arm operated by the distributor shaft. This arm is caused to move by the centrifugal force of the weight to which it is connected and when the arm is in the raised position the resistance is in series with the shunt field, thus decreasing the current and consequently cutting down the charging rate at high speeds.

WAGNER

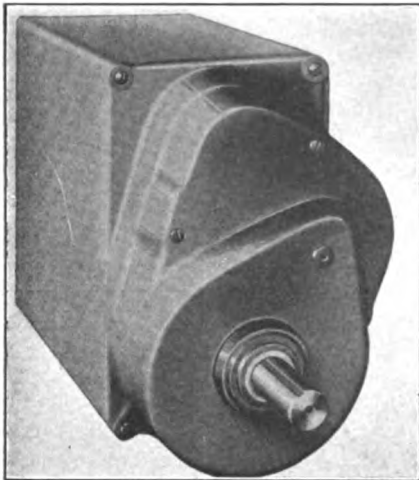
In general the starter made by the Wagner Electric Mfg. Co. St. Louis, Mo., is smaller for 1915 and weighs less than the 1914 machine. In the lighting generator, which is a separate unit, some slight changes in mechanical design have been made, due to differences in methods of mounting, these, however, not including any alteration in the electrical characteristics.

Each Installation Special

Definite models with stock names are not manufactured, but special units to fit each car are produced. For instance, in determining the size of a starting motor, tests are made to determine the torque necessary to start it from rest and keep it running at various speeds.

The method of connecting the cranking motor to the engine rests with the motor car manufacturer. Both chain drive with over-running clutch and flywheel drive have, however, been used. Likewise, within certain limits the manufacturer may specify the voltage. To date only the double-wire system has been built and the starting and lighting machines are separate units, although a

single-unit system similar to that which was manufactured two years ago will be furnished when desired.



One of several Remy electrical units which is fully enclosed—Type 150

REMY

It is the policy of the Remy Electric Co., Anderson, Ind., to manufacture starting, lighting and ignition apparatus to meet the requirements of each particular make of engine, yet there is a variety of standard models. These include 6-volt starting motors and lighting generators separately mounted, two-armature starting and lighting machines with one armature above the other, 12-volt motor-generators, and both 6- and 12-volt generators with ignition equipment integral.

Starter for Eights

The most important development in the starting line is the introduction of a motor for eight-cylinder engines. Some of the motors are arranged for connecting direct to the car maker's reduction gear, others are designed to become an integral part of the reduction transmissions, others complete with reduction gearing and others with the Remy inertia pinion, which automatically engages and disengages with the flywheel type of drive. These standard starting motors are all wound for 6 volts and the variety is such that there is a motor for every size of engine.

Four sizes of the two-armature motor-generators are made. These instruments combine a generator and motor in one unit, one armature being arranged above the other; the reduction gearing, an over-running clutch, is built into the housing and operates in a bath of oil. The 6-volt winding is standard and there is but one point of attachment to the

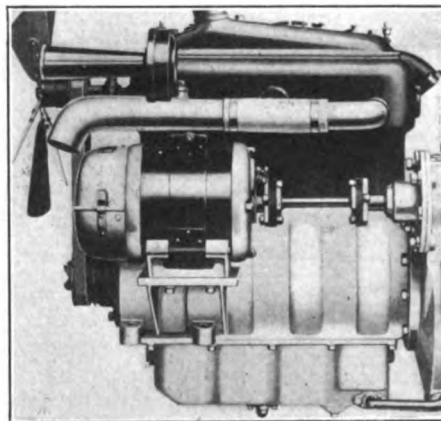
engine. The armature rotates only when the starting switch is closed and at this time drives the generator shaft through the medium of an over-running clutch of the roller type.

One Armature Motor-Generator

The single-armature motor-generators are wound for 12-volts and are built in either cylindrical or rectangular shapes and in a number of sizes. Any of these may be had with battery ignition, forming starting, lighting and ignition in one unit.

Several models of separate generators are also built. Some have drop-forged pole pieces rectangular in shape and others are cylindrical. Some of these instruments are built to fit the standard magneto base and drive coupling.

Combined starting and ignition generators may be had with the ignition parts mounted in unit with the generator or separately. Two different types of bat-



Application of the North East starting motor and generator to an engine

tery ignition are used, one with the conventional form of magneto breaker and distributor and the vertical type with one above the other.

Supplementary Ignition System

In addition, the company is making a system of ignition which may be used in conjunction with an electric lighting system comprising generator and storage battery. In one type a distributor and transformer coil is mounted on a base of magneto dimensions, allowing it to be mounted on the base formerly utilized by the magneto. In another type of instrument the shaft is vertical and both distributor and breaker are driven at camshaft speed.

and engine starting system designed for application to Ford cars. It is an unusually compact system, with the motor and generator separate but mounted together. The generator is horizontally mounted and the starting motor stands on end and drives through worm gearing. The generator operates at about twice crankshaft speed and is connected through a chain. The motor, like other Hartford motors, is of the extreme high-speed type, operating at between 8,000 and 10,000 r. p. m. The gearing is such that it cranks the motor at 300 r. p. m. The weight of the entire system is given as about 100 pounds and it will sell for \$100, not including the lamps.

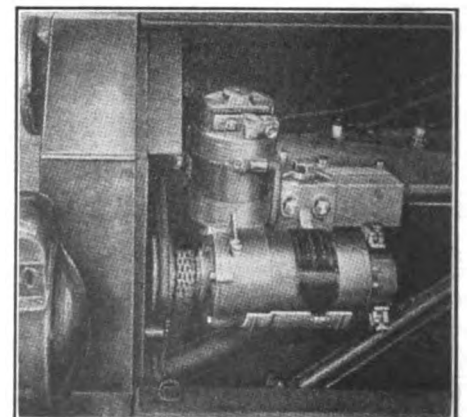
BIJUR

A motor-generator built in four different sizes and for both 6 and 12 volts is the newest model put out by the Bijur Motor Lighting Co., Hoboken, N. J. Separate motors and generators in sizes to suit the manufacturer are continued.

A new feature noted on three models of the starting motor is the direct-gear drive, in which a small pinion keyed to the armature shaft meshes directly with teeth cut in the flywheel, thus dispensing with over-running clutches and intermediate gearing. These machines are high-speed types, designed to rotate as fast as the engine may drive them without danger of injury.

Two starting motors with gear reduction and over-running clutch are also made. Improvements have been made in manufacturing methods, but no changes of importance either in the principles of mechanical or electrical construction have been made. The machines are practically the same size but the torque has been increased.

Six volts is preferred, but both 6 and 12-volt systems are made. The method



The Hartford Ford outfit, the generator horizontal and the starting motor vertical

HARTFORD

The Hartford Suspension Co., Jersey City, N. J., has brought out a lighting

of wiring is left to the manufacturer.

The speed of cranking and the current draw naturally vary but on a certain 4.5 x 5.5, six-cylinder motor, the cranking speed varies from 120 to 140 r. p. m. under normal conditions. It is claimed to start the motor in the coldest weather on the magneto, and this requires a speed of 80 to 100 r. p. m. The current draw depends on the motor, temperature and oil viscosity, but it varies from 75 to 150.

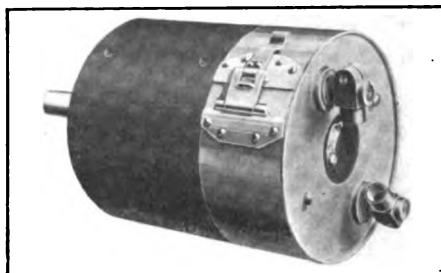
Both 6- and 12-Volt Systems

Voltage regulation is by vibrating switch mounted in an aluminum case on the top of the generator. This box also contains the cutout. Projecting from the rear of this box is a disconnecting and reversing plug. Due to the reversible characteristics of this machine the battery may be connected without regard to polarity.

In the motor-generator one armature and one set of field windings are employed, both for running the machine as a motor and operating it as a generator, and it is geared to run at a fixed rate of speed with respect to the motor regardless of whether it is using or generating current. There is no cutout and no voltage regulator; the system consists merely of the motor-generator, the storage battery and a switch, which is generally connected to the ignition switch or else is incorporated with it. Closing this switch, therefore, turns on the ignition and allows current to flow from the battery to crank the motor. A compound field winding is employed and the wiring is so arranged that when the device is a motor the series field adds its strength to that of the shunt field, thus increasing the total magnetic field strength and allowing the motor to develop sufficient starting torque; but when running as a generator the two fields buck each other, the shunt field detracting from the series field with the result that the net field strength is the difference of the two. This arrangement keeps the voltage within practical working limits regardless of the speed, for as the speed rises the proportional increase in strength of the series field is largely offset by neutralizing effect of the shunt field, so that even at maximum speed the voltage is not too great. The motor-generator is connected to the motor either by silent chain or gear, the ratio ordinarily being somewhere between 2.5 and 3 to 1. At very low speeds the voltage generated is not equal to that of the battery and hence current must flow from the battery, and the device becomes a motor.

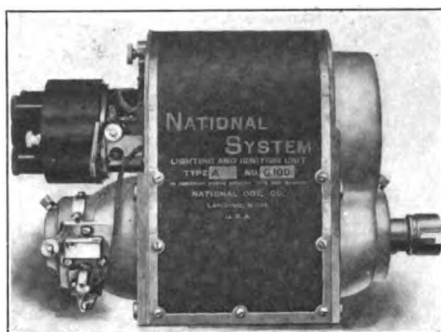
As long as the voltage generated by

the instrument is below that of the battery the device continues to operate as a motor and aids the motor in its rotation, the amount depending on how near the generated voltage is to the battery voltage. Ordinarily the device operates as a motor only for a few seconds, as the speed of the engine becomes so great that the generated voltage rises above that of the battery and then current flows from the motor-generator to the battery and the machine is now a generator. It



National cylindrical starting motor showing complete enclosure of all parts

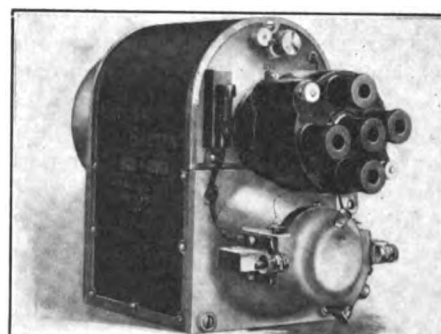
is interesting to note that with this system stalling is next to impossible, because the moment the motor speed drops



Side view of the National combined starting, lighting and ignition machine

the starting system automatically comes into action.

The accompanying diagrams show the simplicity of the wiring. The upper one



Three-quarter front view of same machine showing the distributor and brushes

illustrates the device as a motor and the lower one as a generator. The arrows indicate the direction of the current flow. In the motor diagram the movement of

the current through the series and shunt field is in the same direction, whereas in the generator diagram the current flow through the series field is reversed but the flow through the shunt field is in the same direction. The motor-generator is made in four sizes in both 6- and 12-volt styles and is designed to crank motors up to 25 horsepower S. A. E. rating.

NATIONAL

A combination ignition and lighting generator, and a starting motor are manufactured by the National Coil Co., Lansing, Mich. The generator is made in two models, one for four- and one for six-cylinder motors. The starter is produced in two sizes also. Six- or 12-volt systems are made as required.

The generator is shaped like a magneto with the breaker box and distributor at one end and carries the average lamp load when the car is running at 8 to 10 miles per hour.

A feature is the provision for increasing the output in cold weather, when the efficiency of the battery is reduced, which is done by changing a screw plug on the front plate of the generator. The field windings are protected from excessive current by a fuse located on the front of the machine. The four-cylinder lighting generator runs at crankshaft speed and the six, at one and one-half crankshaft speed.

Vibrator Regulating System

Few changes are noted in the generators except that the regulation on the six is a constant-current system, in which a vibrator is used. This instrument has also been reduced in height about 1 inch. In the four, current regulation is by means of a third brush.

The starting motor is a series-wound type, cylindrical in shape, and at the brush end there is a removable waterproof cover, affording access to the brushes.

Additional torque is a feature of the new starters and a reduction in diameter of .25 inch has been made. A cut of 7 pounds in the weight is the result of substituting aluminum castings for iron. Various types of drive are used, the worm being the most usual.

On a four-cylinder 4.125 x 4.5 motor the starter will crank at a speed varying from 120 to 130 r. p. m., depending on the tightness of the different parts of the motor. The current consumed while cranking will approximate 125 amperes at 6 volts.

In connection with the lighting system the company makes a unit switch which contains the ammeter, relay and switches for lights and ignition. This grouping of units in one housing simplifies the wiring.

ALLIS-CHALMERS

A larger size motor-generator is the one addition to the Allis-Chalmers Mfg. Co.'s 1915 line. This company, which is located in Norwood, O., is continuing the motor-generator for smaller cars, and in addition makes separate starting motors and generators. Each of these is manufactured in one model and in two sizes. Six volts are standard and either the single or double wiring systems may be used.

Improvements consist in refinement of details, and the only change of importance is the more liberal design of the magnetic circuit of the starting machines so that greater torque is secured.

In all models the special radial brush holders are retained and the armatures are banded together with steel wire not only on the core but also on the front and rear connections. These bands are secured against any tendency to slip, and after the armature has been impregnated in Bakelite it is capable of withstanding any overspeed to which it may be subjected, it is said.

Current Builds Up Quickly

As a generator the unit is designed to cut in well below a car speed of 10 miles per hour and to generate full charging current as soon as possible.

No reduction has been made in the size of the smaller motor-generator. It is 5.63 inches in diameter and 10 inches long and weighs 35 pounds. The larger motor-generator, which is new, is 6 inches in diameter, 10¼ inches long and weighs 48 pounds.

As used on some cars, the motor-generator is driven by a silent chain from a sprocket on the crankshaft just behind the flywheel, the ratio being 3 to 1. On another car using a motor with cylinders 2¾ x 4 inches, the motor-generator is driven through gears at a ratio of 3 to 1, the gear on the flywheel driving the sprockets on the motor-generator shaft.

On the smaller size of motor-generator the stalled current is approximately 300 amperes and when cranking the current varies from 60 to 100 amperes. The larger size motor-generator takes 500 amperes stalled current and a cranking current of 60 to 130 amperes.

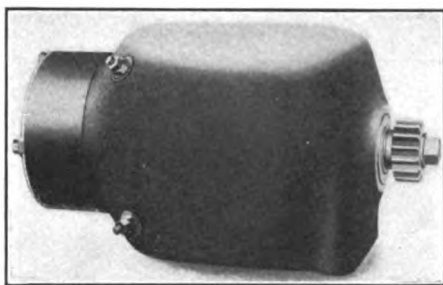
The separate starting motors and gen-

erators measure 4½ x 9½ inches and weigh about 22 pounds. The motor has a long shaft extension to accommodate the Bendix screw gear. On one newly-designed motor the application has been made directly to the flywheel at a ratio of approximately 11 to 1 and the engine is cranked at a speed of 175 r. p. m. The generator on this installation is driven at 2½ times engine speed.

Current regulation is by means of a vibrating reed regulator.

DISCO

Disco equipment consists of two single-unit motor-generator models, both rectangular in shape with rounded edges, and with the combined cutout and regulator mounted on the top of the instrument. These instruments are built for 12 volts, although a larger or smaller voltage will be furnished when desired. Also for very large installations separate motors and generators are furnished. The single-wire system is preferred, al-



Disco combined starting and lighting unit; the case is well rounded

though the units are suited for either single or double wiring. Drive is usually taken direct from the crankshaft by silent chain.

Generation of current begins at about 10 miles per hour with ordinary gearing and reaches full output at 13. The current is held from rising as the speed increases by the regulator, which automatically inserts a large resistance in the shunt field the instant the current rises above the rated value, thereby causing the current to fall again and then the resistance is cut out. This operation takes place with great rapidity so that no fluctuation of current is perceptible. The new generators have been reduced in size and weight.

Low Current Draw

A speed of from 180 to 250 r. p. m. is possible with the unit operating as a motor, the higher speed, of course, being obtained with smaller engines. The current draw under normal running conditions is from 60 to 75 amperes.

WARD LEONARD

A larger and smaller starting motor, making four in all, a dynamo for small cars, and an engine-speed generator for four-cylinder cars have been added to the output of the Ward Leonard Electric Co., Bronxville, N. Y. A motor-generator also will be furnished for small cars when desired.

The two new starting motors are identical with the two motors of this year except in size. All motors are series wound, and are designed to crank the engine at a speed of about 125 r. p. m., with an average current consumption of 125 amperes at 6 volts. This voltage is standard, although 12 volts may be had. Likewise the double-wire system is recommended, although the single may be used.

Starting Torque Increased

Only one change has been made in the new motors and that was to give slightly increased starting torque; in all other respects the machines are unaltered. The Bendix spiral drive is standard.

A small high-speed generator for small cars with a lamp load of corresponding proportions has been brought out to meet the demand for a unit of this size. It may be driven by chain or belt. In addition, a generator designed to be driven at magneto-shaft speed has been brought out. This generator supplies 10 amperes at 400 r. p. m. Up to the present, one generator has been used both for four- and six-cylinder motors, it being direct-connected to the magneto shaft on the sixes and geared up on the fours, but with the coming of the new model the 1914 generator will be continued for six-cylinder machines exclusively and the new one will be for fours exclusively.

The generators are shunt-wound, current regulation being by means of an automatic controller of the vibrating type. No change has been made in this device since it was brought out five years ago.

By means of this device the dynamo will not charge the battery at a greater rate than 10 amperes regardless of the motor speed. This device also acts as a cut-out, breaking the circuit when the speed of the generator falls too low to generate voltage equal to that of the battery.

The Ward Leonard company is prepared to furnish starting and lighting specialties to manufacturers of this equipment. These parts include enameled resistance units for controllers, for dimming headlights, cables, switches and

combined controller and automatic cut-out.

Both starting motors and lighting generators are built with either round or square housing to suit the individual manufacturer.

This company makes a specialty of furnishing current controllers to other makers of starting and lighting equipment and offers its complete system only to car manufacturers.

The motor-generator is compact for the reason that large wire of low resistance is used in the series field, with the result that a strong field and high starting torque are obtained. The standard type of controller is used with this machine; thus the current is kept at a constant value as in the separate machines. This controller is short-circuited during the starting period and is automatically inserted when the engine is started. Constant current is supplied from the time the dynamo cuts in on the battery until maximum speed is reached.

DYNETO

Two motor-generators are made by the Dyneto Electric Co., Syracuse, N. Y. Model A is a new one, designed for small bore motors and Model B is continued from 1914. No radical changes have been made in the new instruments, although some refinements have been made; thus the generator has been altered so that it begins to charge the battery at a somewhat lower speed. Twelve volts is standard, although other voltages can be supplied, and either single- or double-wiring may be used. Silent-chain drive is to be preferred, although gear drive may be had. The gear ratio is between 2.5 and 3 to 1.

High Cranking Speed

The Model A motor-generator has a static torque of 25 pounds at 1 foot radius, weighs 35 pounds and generates its rated output at 1,000 r. p. m. The Model B gives a static torque of 36 pounds, weighs 45 pounds and also produces its rated output at 1,000 r. p. m.

A cranking speed of 125 r. p. m. or more, depending on the size of the engine, is obtainable, the current draw varying under the conditions. With a stiff, cold motor the draw might run as high as 225 amperes for an instant. A compound winding is used so that when the machine operates as a generator the net strength of the field is the difference of the series and shunt fields, and when running as a motor the strength of the two fields is added.

NORTH EAST

A single machine for starting, lighting and charging the battery and made in but one model is built by the North East Electric Co., Rochester, N. Y. There are, however, several different methods of application, so that it may be attached to any car. The latest method is termed the universal application. For larger cars the system operates on 24 volts and on smaller ones 12 volts is standard.

No reduction in size has been made, but efficiency has been increased, the torque is higher and an improved regulating device has been designed. In nearly all applications the gearbox-type of drive has been eliminated, the drive generally being direct from the crankshaft by silent chain.

The cranking speed varies from 150 to 200 r. p. m., depending on the size of the engine, and the ampere draw when running varies from 50 to 60 for a conventional 4 x 4.5-inch four-cylinder motor, although at the instant the starter switch is closed the flow may reach 125 amperes.

The charging rate is approximately 7 amperes at 12 volts. The charging circuit is automatically closed at about 9 miles per hour.

Unusual Voltage Control

Voltage regulation is by double field windings with a limiting relay regulating the field resistance.

Special fittings are made so that this system can be applied to the Ford car. The motor-generator is placed at the left of the motor and the battery carried under the rear floor boards. The motor-generator is mounted on a bracket which bolts to the lower cylinder flange and the armature is connected to the crankshaft by a double silent chain, there being an intermediate pair of sprockets through which the fan is driven.

The universal system is designed especially for old cars and may be attached with very little fitting. The motor-generator is mounted between the front frame members by means of two cross bars.

The rear bar is an angle iron which bolts at each end to the webs of the channel frame section by means of small angles. In the front the unit is supported by a heavy tube clamped to the horns of the springs.

The motor-generator is placed above the plane of the crankshaft and as the driving chain is at the front the shaft which runs to the crankshaft passes under the unit. This shaft has long flutes

milled in it and it may be cut to any length desired. The coupling, which makes connection between this shaft and the front of the crankshaft, is left blank and is machined to suit each particular installation.

Fourteen-volt bulbs are used on both the 21- and 24-volt systems throughout. The headlamps are 21 candlepower, the sidelamps 4 candlepower and the tail also 4 candlepower.

GENEMOTOR

The General Electric Co., Schenectady, N. Y., large makers of motors and generators of all sizes, has brought out a 12-volt motor-generator known as the Genemotor. The machine is designed especially for Ford cars and sells complete without lamps for \$80. A. J. Picard & Co., 1720 Broadway, New York city, is the sole distributor. The Genemotor is mounted on the left side of the Ford motor on a suitable bracket. The drive is by silent chain direct from a sprocket on the crankshaft. This sprocket takes the place of the fan pulley and therefore the fan is driven by a new pulley attached to the motor-generator armature.

Machine Fully Enclosed

The Genemotor is a fully enclosed machine, cylindrical in shape, about 7 inches in diameter and 10 inches in length. It is firmly secured to the body of the engine by a special bracket, which can be attached without fitting. There is no drilling or tapping of holes. When mounted it is supported rigidly and is fully covered by the engine hood. The regulation of the charging current for the battery is accomplished without the use of external regulators. The windings of the Genemotor itself being so arranged as to give the necessary regulation.

The motor starting switch is mounted directly at the top of the machine and is actuated by a pushrod passing through the dashboard of the car and having its handle located within convenient reach of the driver. This switch is enclosed, but accessible.

When operating as a generator it begins to supply current when the car is running at about 9 miles per hour, and its windings are so arranged that overcharging is prevented. The main switch is closed through a cam actuated by a pushrod. The contacts are of the multi-leaf pattern and the switch is provided with a mechanism which assures a clean brake on opening.

U. S. L.

One model of motor-generator of the well-known flywheel type will be manufactured by the United States Light & Heating Co. for 1915. The design, however, is modified to suit each installation as regards flywheel weight and torque.

Improvements have been made in armature, fields and commutator. Instead of a steel V ring construction in the commutator a steel reinforced moulded insulation is now used, the advantages being lighter weight and greater strength.

A new light and strong alloy has been adopted in the armature spider. The starting switch is now cast integral with the crankcase. Weight has been reduced by 25 per cent and the space occupied by the entire system about 30 per cent. The 12-volt system is standard and double wiring is recommended for starting and either double or single for lighting.

A feature of the new machine is the reduction of the maximum current output at high speeds by developing a high charging current at low engine speeds. Regulation, which is inherent, has been

improved so as to secure a dropping characteristic; that is, the highest charging rate occurs at about 500 r. p. m. and then gradually drops off. This maintains the battery fully charged even under the most adverse conditions. Considerable increase has been made in the efficiency of the machine.

The average speed of cranking is between 150 and 200 r. p. m. For example, a certain $3\frac{1}{8} \times 5\frac{1}{2}$ motor is spun at 220 r. p. m., and a certain $4\frac{1}{4} \times 6$ motor at 190 r. p. m. The first motor requires a current of 100 amperes and the second 170.

Battery Ignition Systems

CONNECTICUT

This is a complete ignition system consisting of a combined timer and high-tension distributor, a separate coil and a switch. It is a magneto mechanism without the generating unit, depending for its source of current for starting on a storage battery and then operating with the usual car generator. The system is distinctive in a number of respects, prominent among which is the fact that the timer is so constructed that the primary circuit of the coil is caused to become thoroughly saturated, with the result that a spark of maximum intensity is produced. Another distinctive feature is the incorporation in the switch of a thermostatically-operated electro-magnetic device which automatically breaks the connection between the battery and the coil should the switch inadvertently be left on with the motor idle.

The complete saturation of the pri-

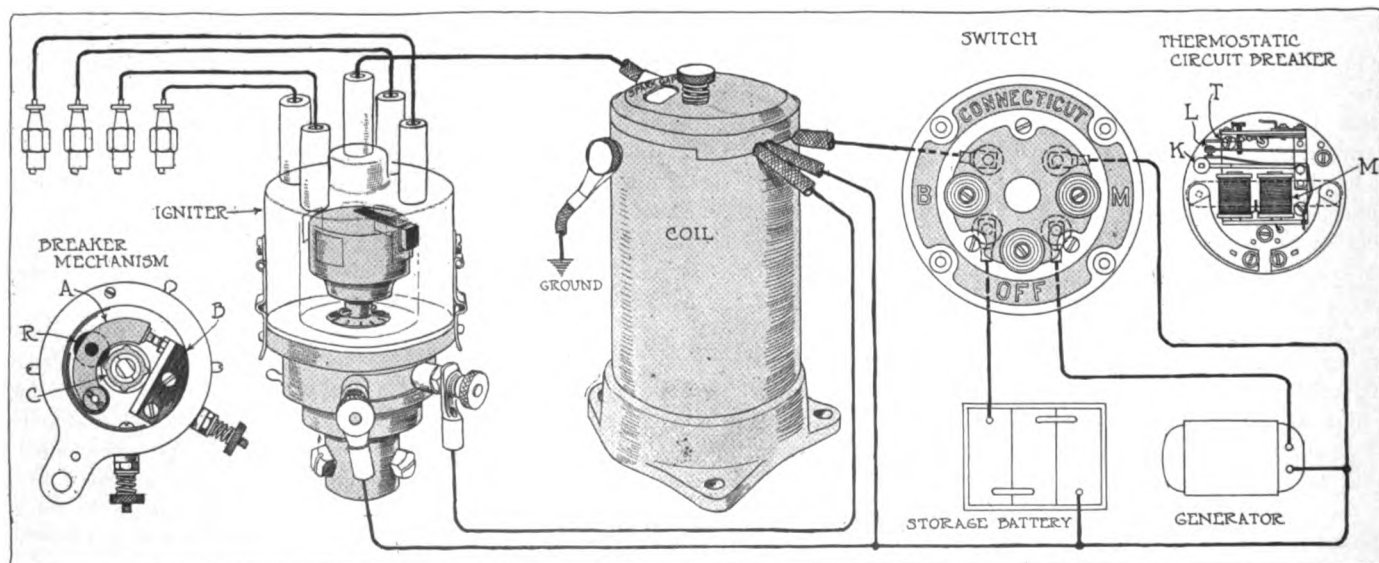
mary winding of the coil upon which depends the intensity of the sparks produced at the plugs, as well as the practical elimination of both mechanical and electrical lag, are due to the construction of the circuit breaking mechanism and to the fact that it operates on the closed-circuit principle. Reference to the accompanying sketch, which shows a four-cylinder installation though the system is made for both six- and eight-cylinder motors as well, will make this fact plain.

The breaker mechanism consists of the arm A, carrying one contact, a stationary block B, carrying another contact, a fiber roller R, which is carried by the arm A, and the cam C, which is mounted with the driving shaft. Normally, the contacts are held together under the action of a light spring. As the four cams, which in touching the roller R raise the arm and separate the contacts are 90 degrees apart for a four-cylinder motor, the period of saturation of the coil or the length of time the current flows to

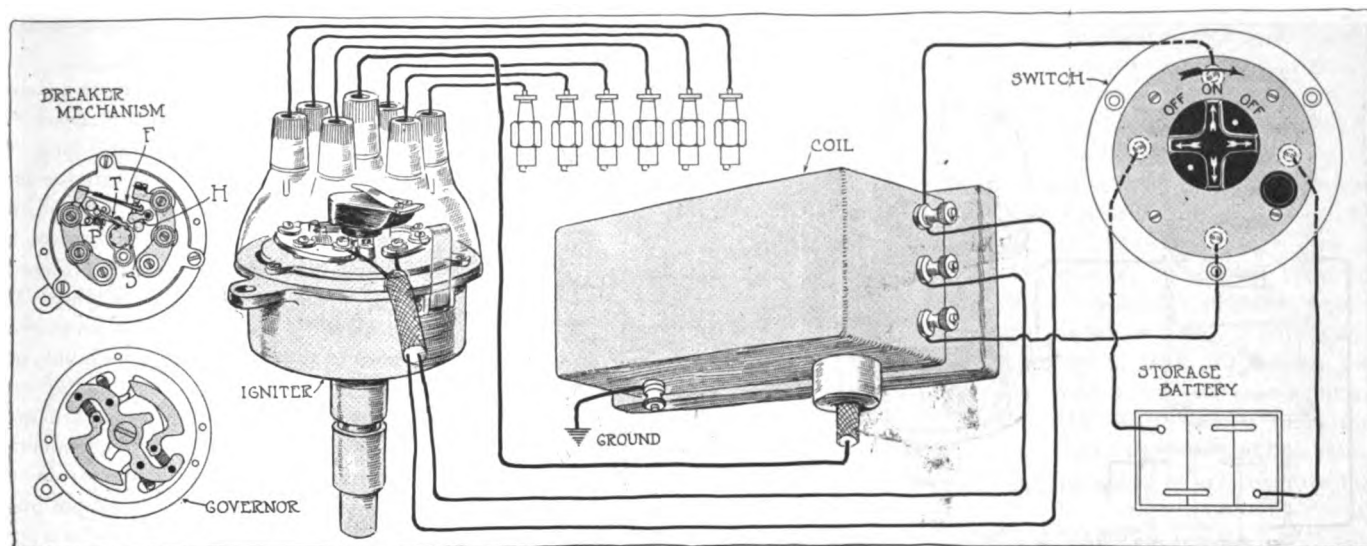
it from the battery is at the maximum. Hence, when the contacts are separated, the current which has piled up, to use a homely analogy, induces an intensely hot spark at the plug.

It follows as a matter of course that the slower the speed of the engine—the timer rotates at half crankshaft speed—the greater will be the saturation of the primary coil, and hence, the more intense the spark. It is largely this intenseness, coupled with the fact that mechanical lag has been eliminated by the simplicity of the mechanism, that electrical lag has been done away with. This means, briefly, that for a given setting of the spark advance lever, the spark will recur at exactly the same point in the piston travel regardless of engine speed. This is what is termed synchronism.

As the battery ordinarily would be discharged if the switch inadvertently were left in the on position with the motor idle, some provision had to be



Diagrammatic view showing the parts of the Connecticut ignition system in their proper relationship with each other and the simplicity of the wiring connections



The Atwater Kent ignition system operates on the open-circuit principle and delivers a single spark at each plug; the circuit breaking mechanism operates at the same speed regardless of engine speed

made to obviate this possibility. This has been done in the switch which incorporates a miniature thermostat which automatically breaks the circuit at a predetermined time—adjustable, 30 seconds to 4 minutes—between the closing of the switch and the actual starting of the motor. This gives the driver time to get to the crank after turning on the switch.

The switch itself has three buttons, B for battery, M for magneto, or generator current when a lighting system is employed, and a third to release either of the other two. These three buttons are so arranged that the depression of either of the first two releases the other if depressed. Thus, the battery button automatically returns to normal position when the M button is pressed, and vice versa. Both cannot be depressed at once. The off button releases the one which is depressed.

The thermostat circuit-breaking mechanism is enclosed within the switch. This consists of the thermostat T, which heats when the current passes through it for from 30 seconds to 4 minutes without interruption and is bent downward, making contact with the contact L. This completes an electrical circuit which energizes the magnets M, causing the arm K to operate like the clapper in an electric bell. This arm strikes against a plate, which releases whichever of the two buttons in the switch may be depressed.

The system can be adapted to any four-, six- or eight-cylinder motor and operates normally on a 6-volt storage battery with six dry cells for emergency use where there is no electric lighting generator. Where there is a generator, this takes the place of the dry cells, the storage battery being used for starting.

ATWATER KENT

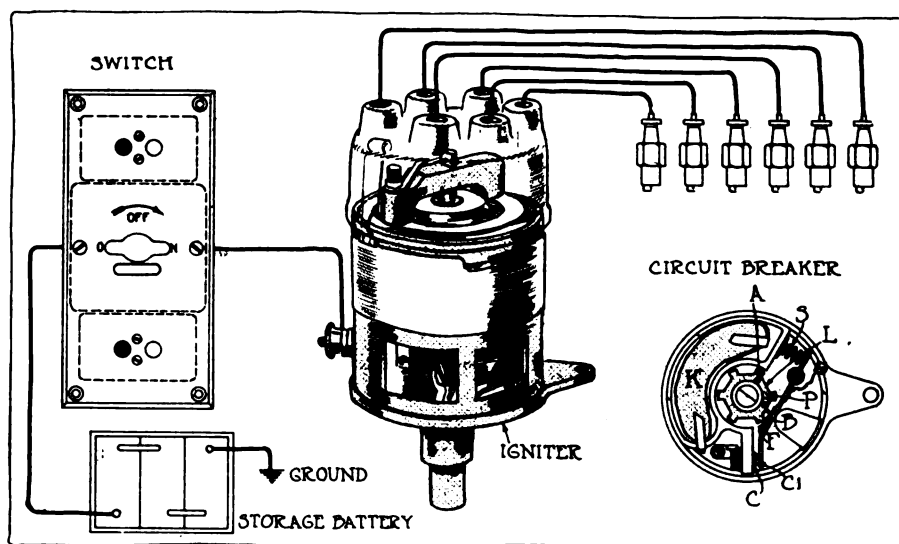
The battery ignition system developed by the Atwater Kent Mfg. Works, Philadelphia, Pa., is complete in itself and is not dependent for operation on anything other than a standard 6-volt storage battery or a set of six dry cells connected in series. It consists of the Atwater Kent Unisparker, a coil and a reversing switch which is mounted on the dash. The system is made for four-, six- and eight-cylinder motors and the only moving part is the Unisparker, which is intended for vertical mounting and operates from any rotating shaft through suitable gearing at half crankshaft speed.

The Atwater Kent system, as the name of the principal part indicates, delivers a single intense spark at the plugs and the mechanism is such that the duration of current flow through the primary winding of the coil remains constant regardless of engine speed; also, the make and break mechanism is mechanically operated and is not dependent upon magnetism and hence operates regardless of the condition of the battery. Another distinctive feature of the system is that it incorporates a centrifugally-operated spark advancing mechanism which makes unnecessary the usual spark advance lever.

The Unisparker operates on the open-circuit principle; which is to say that the contacts normally are held apart. They come together for an exceedingly brief period—as a matter of fact, the operation of the breaker mechanism is far too rapid for the eye to follow—and are immediately separated again. Hence, the amount of current consumed per spark is small.

The shaft S, which is the rotating portion, has a number of notches—four, six or eight, according to the number of cylinders—cut in the sides. The trigger T catches in these notches and is drawn around a fraction of an inch with the shaft, when it escapes from the notch, rides up slightly on the inclined surface, and being returned to its normal position by the coil spring P, comes against the miniature hammer H. This hammer in turn strikes the flat spring F, permitting the contacts to come together for a small fraction of a second. All of these various parts are made of hardened steel and as they are exceptionally light wear is negligible and should not make its appearance during the life of a car. The only parts which will show wear are the tungsten contact points, though these should not require attention oftener than every 10,000 miles, for the direction of current flow automatically is reversed by the switch each time the motor is started. The adjustment of the contacts is ingeniously effected. Beneath the head of the adjustment screw there are a number of very thin shim washers, one or more being removed when the contacts are dressed and set up. One of the important features of the system is that the battery cannot be exhausted if the switch inadvertently is left in the on position. This is because the open-circuit principle is used, the contacts coming to rest separated.

The action of the automatic spark advancing mechanism is obtained from four weights distributed symmetrically about the two shafts of the device. The lower of these shafts projects through the casing and is the drive shaft. The upper shaft operates the breaker mechanism and is not positively connected to the lower one. The connection between the



In the Westinghouse ignition system, timer, distributor and coil are all mounted in the same housing; the timer operates on the closed-circuit principle

shafts is through two S-shaped cross pieces, one of which is permanently attached to each shaft and which are held opposite each other by light springs. When the shaft rotates slowly, it carries with it the upper shaft without varying the relationship of the two. But as the speed increases, centrifugal force separates the weights which are attached to the S-shaped cross pieces, causing them to separate radially, the upper one thus obtaining a slight lead over the lower one. As the upper shaft is directly responsible for the sparks produced, the ignition is automatically advanced.

The switch has a handle which is continuously rotatable in only one direction, a quarter turn serving to switch the current on or off, according to the prior position of the handle. This switch automatically reverses the direction of current flow. A removable plug constitutes a lock.

In addition to the standard Atwater Kent system, there is also a system designed especially for Ford cars. This consists of the same units together with a special bracket which is attached without machine work; it sells for \$22.

WESTINGHOUSE

The battery ignition system which has been brought out by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is a complete ignition unit, drawing current from the storage battery usually part of the equipment of a car. The system, which is made for both four- and six-cylinder cars, differs from others in that the primary current timer, the high-tension distributor, the coil and the condenser are contained in a single unit;

the switch forms the other unit of the system.

The timer-distributor-coil unit, which is the heart of the system, is designed to be vertically mounted and operated from the cam or magneto shaft through suitable gearing. The casing measures $3\frac{1}{4}$ inches in diameter and is about 5 inches in height.

The breaker mechanism, which is shown herewith in plan, is quite similar to that used in other Westinghouse instruments except that it is not provided with the automatic advance mechanism. The contacts C and C' normally are held together under the action of a small coil spring S; the peculiarly shaped cam L is mounted loosely on the shaft and is turned by the pin P, which comes against the stops A or B, according to the direction of rotation. The unit operates equally well in either direction. Hence, a backward travel of some 48 degrees is possible without causing the contacts to separate and induce a spark and backfire. The cam in rotating rubs

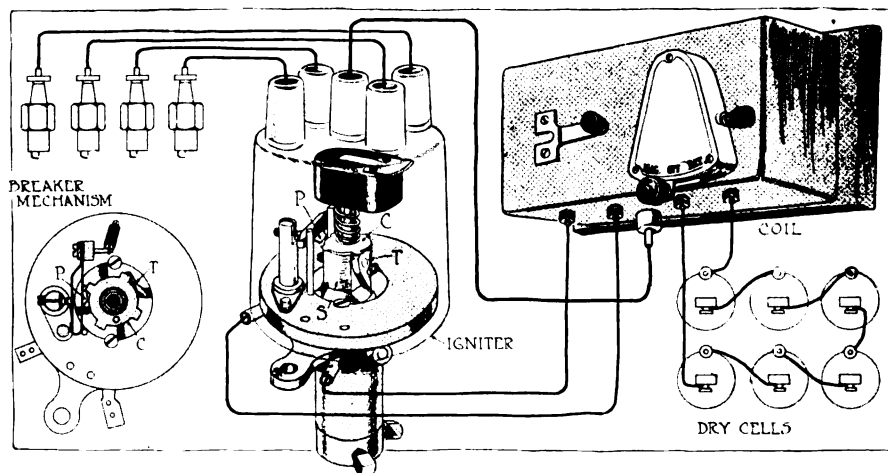
against the fiber block F, thus separating the contacts.

The condenser K is mounted adjacent to the breaker mechanism, these two units being beneath the coil and the distributor, as indicated in the accompanying phantom drawing. The condenser, coil and breaker mechanism are enclosed in a tube of Bakelized Micarta, which forms the body of the unit. The coil itself is imbedded in a heat-proof insulating material. Over the lower part of the Bakelite tube there is a metal ring which can be moved upward after a screw is loosened to permit inspection or adjustment of the contacts; in the phantom view, this collar is shown pushed up, exposing the adjustment screw.

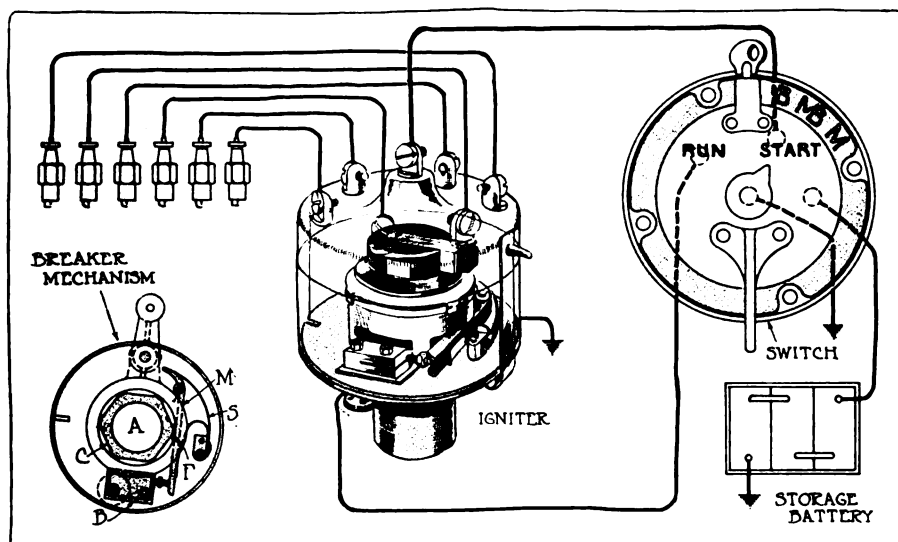
As the coil is enclosed in the same casing with the interrupter, no external wiring is necessary between these units. In fact, but one wire, from the battery or generator to the single terminal on the interrupter, is necessary.

The high-tension distributor is the same as that used in the regular Westinghouse generators and gives a wiping contact. There are two round brushes pressed apart by a small coil spring, one of the brushes making contact with the terminal from the coil and the other rubbing over the six contacts which connect with the wires to the spark plugs.

The standard ignition switch is of the snap type, intended to be mounted flush with the dash, and is combined with the lighting switches in one plate. The construction of the switch is such that each time the ignition current is turned on the direction of current flow is reversed, thus minimizing the pitting effect and prolonging the life of the contacts. Where desired, a kick switch with lever also can be supplied and in this the direction of current flow is governed by the way the plug is inserted and often is changed inadvertently.



The Rhodes system operates on the open-circuit principle and delivers a single spark to each plug; operation of the breaker is not dependent on the battery



The Bosch battery system was developed to supplement magneto ignition, though it may be used alone; it is a closed-circuit system with timer and distributor in same housing

RHODES

The Rhodes ignition system, which is produced by the New York Coil Co., New York, is a complete battery ignition system in itself and will operate on six dry cells or on the usual battery equipment of an electrically lighted and started car. It is made for both four- and six-cylinder cars and may be substituted for any timer on any car not provided with magneto ignition. It is made to fit shafts $\frac{1}{2}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{9}{16}$ and $\frac{5}{8}$ inch in diameter.

The complete system consists of a combined make-and-break mechanism and a high-tension distributor contained in a single casing which measures $5\frac{1}{4} \times 3$ inches, and a simple non-vibrating coil with switch to be mounted on the dash.

The make-and-break mechanism operates on the open circuit principle and it is impossible for the battery to be exhausted should the switch inadvertently be left in the on position because the contacts invariably come to rest separated. This is due to the unusual construction of the breaker, which is illustrated herewith in phantom.

The rotating shaft S carries with it a trigger T, which trips over four teeth E, and in doing so raises the notched collar C. This collar is keyed to the rotating shaft and as one of its notches comes over the projection P on the contact springs the trigger trips over its tooth, letting the collar down under the influence of a coil spring and thus momentarily forcing the contacts together and permitting them instantly to spring apart again. The inserted plan view of the breaker shows the position of the mechanism at the instant when the contacts are together.

From the foregoing it becomes appar-

ent that but a single, intense spark is produced at each break in the primary circuit of the non-vibrating coil; and as the current is permitted to flow through the coil but a fraction of a second, the drain on the battery is almost negligible.

The distributor mechanism is orthodox in construction. It consists of a radial arm carrying a brass segment which passes close to the four terminals from the wires leading to the spark plugs. As there is no rubbing contact, wear is reduced to the minimum. The entire mechanism, breaker and distributor is enclosed in the one housing, which is made of Bakelite.

The non-vibrating coil follows the usual construction and has been proportioned to produce a spark of the maximum intensity for the brief period of saturation permitted the primary. It is enclosed in a box upon which there is

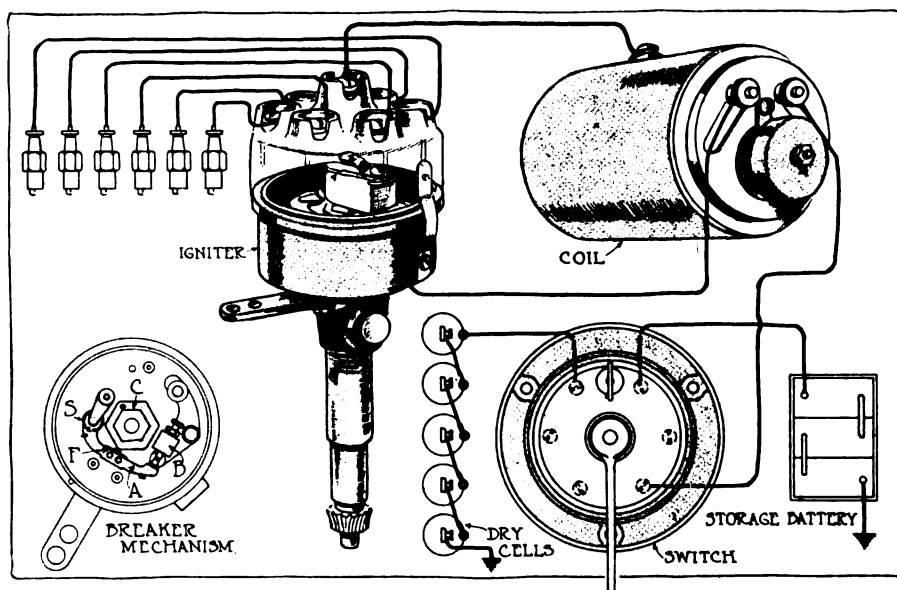
mounted a substantial kick switch and a button, the latter to be used in producing a spark for starting on compression.

In addition to the standard system for other cars, a complete system for use on Ford cars is produced. This uses the regular igniter and coil; it sells for \$27, including the igniter bracket and all necessary fittings. In another Ford system, styled Uni-Coil, a different type of timer-distributor is used. This has a hardened central shaft into which four glass-hard pins are inserted at right angles. As the shaft rotates these pins force the contacts together in succession. The time the contacts are together may be adjusted. This system sells for \$15 and employs one of the Ford coil units and the Ford switch.

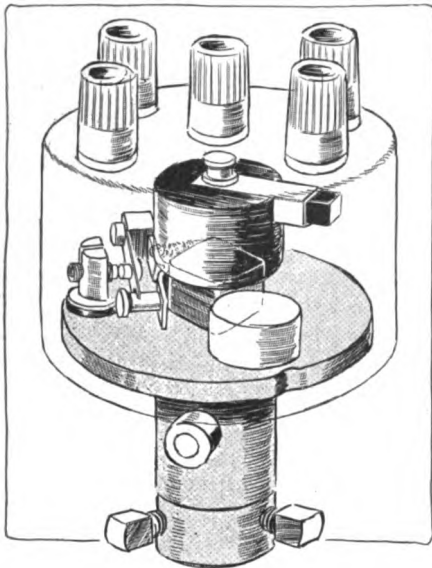
BOSCH

The Bosch Magneto Co., New York, developed its battery ignition system some seven or eight years ago primarily to be used in the event of accident to the magneto, and since then it has hardly undergone any change except for minor refinements of detail. The system as originally developed was intended for use as a supplement to magneto ignition; it can be used either in this way or as a separate battery ignition system for two-, three-, four- or six-cylinder motors.

The complete system consists of a combined timer and high-tension distributor, and a combined switch and coil, the latter unit intended to be mounted with the coil behind the dash and the switch in front. The timer-distributor is mounted on a shaft through which it is driven at camshaft speed and may be placed in any convenient position.



The Remy battery ignition system combines the timer and distributor in the same housing and operates on the closed-circuit principle; wiring connections are simple



Halladay combined timer and distributor designed especially for use on Ford cars

The breaker mechanism, which is shown herewith in plan, is exceedingly simple; the rotating shaft A carries the cam C. The contacts are mounted one on the movable arm M, which is controlled by the spring S, and one in the stationary block B. As the cam rotates it rubs against the fiber piece F, thus separating the contacts. Provision is made for spark timing through the usual manually-operated lever.

The high-tension distributor mechanism is simplicity itself; it is mounted directly over the timer and like it is completely enclosed. It consists of a radial arm carrying a carbon brush which makes successive contact with a number of contacts inserted in the sides of the cavity and leading to the various spark plugs.

The switch is an ingenious mechanism which has a vibrator attachment to facilitate starting under adverse conditions. This mechanism is controlled by the pointed button in the center of the switch plate. Under normal starting conditions, momentary pressure on the button will produce a single spark at the plug in the cylinder on power stroke. But if the motor is very cold and a succession of sparks is desired these may be obtained by turning the button to the right and pressing it, thus bringing the vibrator into use. If desired, the button can be locked in this position until the motor has started when it is turned to the left, causing a single spark at each separation of the contacts in the breaker mechanism.

There are four positions of the switch for use when the system supplements a magneto. These are B, for battery; M, for magneto; MB, for the two together, and O for off. When used in conjunc-

tion with a magneto, the battery system operates its own set of plugs except when the switch is turned to the MB position, when both battery and magneto operate through the magneto spark plugs.

Two-, three- and four-cylinder outfits, complete with battery coil and cable, cost \$45; the six-cylinder outfit costs \$50.

REMY

The Remy Electric Co., Anderson, Ind., has developed its Model 100 magneto type battery ignition system for use on cars which are equipped with electric lighting and engine starting systems and it is therefore intended to be operated on the usual 6-volt or 12-volt circuits. It is made for both four- and six-cylinder motors. The system consists of three parts, the combined timer-distributor, a coil which may be mounted in any convenient position, and a switch to go on the dash.

The make-and-break mechanism is simple in design and all the parts have been made as light as possible consistent with a proper factor of safety. The rotating shaft carries keyed to it a four- or six-faced cam, C, which in rotating rubs against a fiber plug F, thus separating the contacts, one of which is carried by the movable arm A, which is returned to normal position by a coil spring S, and the other by the stationary block shown at B.

The distributor mechanism is equally simple and is mounted in the same unit directly above the breaker. It consists of a radial arm keyed to the rotating shaft with a central spring contact which touches a carbon button imbedded in the Bakelite distributor cover. There is no rubbing contact between the distributor arm and the various contacts to which the wires leading to the spark plugs are attached. Instead, the distributor arm has a tiny pointer on it which comes close to a number of brass pins in the distributor cover to which the spark plug leads are connected. Thus, wear in this part of the instrument is done away with.

Another important feature of the unit is that the advance and retard mechanism is entirely separate from the distributor cover, so that when the timing lever is moved the distributor cover remains stationary, obviating the possibility of chafing of the wires and consequent loss of high-tension current. The distributor segment arm also carries the safety spark gap which protects the system in the

event of a breakage of the high-tension wiring.

The coil which forms part of the system is a special design which is calculated to produce hot sparks on as low a voltage as $2\frac{1}{2}$ (for the 6-volt system) in the event of the battery being badly discharged through accident. The coil itself is very small, measuring but $2\frac{3}{4}$ inches in diameter by $4\frac{1}{4}$ inches in height, and the condenser is fully enclosed.

The switch is a simple design, with a lever which may be operated by the foot. Three positions are provided, B for battery, O for off, and M for magneto, or, more properly speaking, the generator on an electrically lighted and started car. The lever can be locked in the off position with a key which is removable.

The distributor is intended to be mounted on a vertical shaft and driven through suitable gearing at half crankshaft speed irrespective of the number of cylinders. It will operate equally well in either direction, the only change necessary being the reversal of the distributor segment which is marked with an arrow to show clearly the direction of operation.

HALLADAY

The Unit coil ignition system produced by the L. P. Halladay Co., Streator, Ill., is intended only for Ford cars and consists of a combined timer and high-tension distributor and the necessary fittings to attach it to a Ford motor. This igniter uses one unit of the regular Ford coil equipment and the regular Ford coil switch.

The timer mechanism is simple, a rotating shaft carrying a cam which brings a pair of contacts together four times during one revolution of the crankshaft. The high-tension current induced in the single unit of the Ford coil that is used is distributed to the four spark plugs by means of a high-tension distributor which forms part of the one unit. In this distributor a radial brush makes positive contact with four contacts inserted in the distributor housing, which is made of Bakelite.

The bracket which forms part of the system is bolted on in front of the motor and takes the place of the regular Ford timer, which is discarded. The vertical shaft carrying the timer-distributor is driven by bevel gears, which are entirely enclosed. The system complete sells for \$15. It can be installed on any Ford car with little difficulty.

Accessories

Parts & Materials

Many New Devices To Be Seen at Chicago

Speedometers

Stewart—Stewart-Warner Speedometer Corp., Chicago—This is of the magnetic type and has a circular magnet driven by a flexible shaft; over the magnet there is a cup of aluminum fitting closely, but not touching the magnet. On the edge of the aluminum cup are the speed indicating figures, which show through an opening in the dial as the cup is moved against its spring under the pull of the magnet. Two 4-inch models, each listing at \$50, have trip and season odometers and differ only in that one indicates speed up to 60 miles an hour and the other up to 100 miles an hour. These two models are fitted with tungsten electric lights at \$5 extra and may be had for either flush or offset mounting. Two 3-inch models are made, each at \$25, having season and trip odometers and 60-mile range; one is flush and the other offset. The pointer type at \$20 has a needle working over a dial. Special models are made for trucks and for electric cars, as well as combination sets.

Corbin-Brown—Corbin Screw Corp., New Britain, Conn.—Corbin-Brown centrifugal speedometers for 1915 have a new feature, a selective trip reset on the odometer by which it is possible to set the trip wheels at any mileage, so as to pick up a Blue Book route at any point. Another point of interest is the arrangement of the trip odometer wheels on the same spindle as the season wheels, grouping the odometer all together at the bottom of the instrument, leaving a clean dial above for the speedometer. They are made in both black figures on a white dial and white figures on a black dial. Corbin speedometers range in price from \$25 to \$80, in both bracket and flush types, and in combination with Chelsea clocks at from \$65 to \$120.

Garford—Garford Co., Elyria, O.—Garford speedometers are little changed

from last season with the exception that several new flush types have been brought out. The trip reset is this year of the selective pattern, and a new Ford type, selling for \$12.50, has been brought out. The Garford speedometer is of the centrifugal type, but differs from others of its kind in that the active members are free balls instead of fixed weights, acting through a sliding cone instead of toggle-arms. The Garford is made both in white on black and black on white, and has its odometer wheels all on the same spindle. A special fitting for Ford cars is provided.

Recordograf—American Taximeter Co., New York—Besides Jones and Popp taximeters, the American Taximeter Co. produces the Recordograf, a speed, time and distance recorder for trucks, the Transimeter hub odometer, and two new accessories, the Auto-Signalite and the Dinshah engine tester. The Auto-Signalite consists of a combination license number illuminator, tail light and signal. The movement of the signs is controlled by a Bowden wire leading to a lever on the steering column, so that the warning may be made in anticipation of the actual movement of the steering wheel

or release of the clutch. But one continuous light is used, and the signs are plainly legible by daylight. The Recordograf sells for \$60, the Transimeters for \$15, \$16 and \$20, the Signalite \$20, and the Dinshah tester \$20.

Servis Recorder—The Service Recorder Co., Cleveland—This instrument records on the edge of a rotating disk, the periods during which the car is moving; while the car is standing no record is made. The peculiarity of the device is that it is not connected in any way with the running gear; it is attached to the body, and the recording device is operated by side sway, but is unaffected by vibration. The circular card on which records are made is marked around the edge with hours and minutes for full 24 hours. There is no mechanism that can be tampered with. The recorder is sufficiently sensitive to indicate the running of any vehicle.

Speedograph — Speedograph Sales Corp., 11 Broadway, New York—Type in which speed, distance traveled and duration of stops are recorded on a moving tape for commercial and pleasure. A combination of angle and flexible shaft drive is employed, the shaft being heavier than that used for ordinary speedometer drives. The instrument is placed



The complete line of Stewart-Warner motor car accessories as it was exhibited at the New York show—Tire pump, vacuum feed system, speedometers, and a new electrically operated clock

on the dash and is locked and the working parts inaccessible to the driver. Price, with drive complete, \$70.

Van Sicklen—The Van Sicklen Co., Aurora, Ill.—A speedometer for Ford cars has been added. Other interesting features are a new swivel drive to the front axle spindle of the Ford and a back-of-the-gearset drive by a stamped worm as used in the Monroe. The most unique feature of the Van Sicklen instrument is the new black-faced dial with internal lighting. A peek-show booth was included in the exhibit, which demonstrated the legibility secured by this arrangement. The odometer wheels and speedometer scale are in white and receive their light from a lamp contained within the casing of the instrument. The mechanism of this model is of the pneumatic type, in which a small spiral air-pump projects a blast of air against vanes in a cylindrical dial accurately balanced and working against a spring; the faster the car runs the faster the pump rotates and the greater the force of the air blast and the deflection of the dial. The pump is driven by a flexible shaft of special design. The figures are on the rim of the cylindrical dial and show through an opening in the dial plate. Season and rapid resetting trip odometers are incorporated and are worm driven. Bracket type, with $3\frac{1}{2}$ -inch dial, \$12. Flush dash type, \$20.

Hoffecker—Hoffecker Co., Boston, Mass.—Hoffecker-Evans Speedometer-Speedlock instruments have been changed this year from former models. Last year the Speedlock served to interrupt the ignition when the speed exceeded a predetermined maximum. This year, however, the Speedlock acts on the throttle control rod. It consists of a divided throttle control rod, connected by a cylindrical casing attached to that portion leading to the accelerator or throttle lever. The part attached to the carbureter slides loosely in the casing. Within the casing is a pawl which acts on a slot in the latter rod and is released electromagnetically. The Speedlock is a Yale-locked contact, operated by the speedometer, which may be adjusted to make the circuit at any desired speed or at zero.

The Hoffecker speedometer proper is of the centrifugal type, with a hand-indicated 100-mile trip odometer and the usual wheel type of season odometer. In addition to the front-wheel drive, the Hoffecker company has brought out two new transmission drives.

The regular models sell for \$50 and \$75, with an additional charge of \$25 for the Speedlock. For trucks, the Speedlock is offered, attached to the driving shaft, for \$50, or with the speedometer for \$75. Waltham clock combinations, one of which has the Packard shape, sell for \$100 and \$125.

Ever Ready—American Ever Ready Wks., New York—Magnetic type continued in several different models, all of which operate on the same principle. Moving parts are extremely light, and Hoffman ball bearing mountings are fitted. Model 102 at \$15 has a $2\frac{5}{8}$ -inch dial, reads up to 60 miles an hour, and has 10,000-mile season odometer. Model 152, \$30, is the same instrument mounted with an 8-day clock and a hooded electric light. Model 106, \$20, has the same size dial of the same capacity, but has a 100-mile trip odometer instead of the season attachment. Model 156, \$35, is model 106 mounted with an 8-day clock and electric lamp. Model 109, \$25, is a larger instrument, having a $3\frac{1}{4}$ -inch dial calibrated to 80 miles, and has a 10,000-mile season odometer, and 100-mile trip odometer; mounted with 8-day clock and electric light the price is \$40. Model 108, \$25, has a 4-inch dial reading to 80 miles, 100-mile trip odometer and 10,000-mile season odometer; mounted with 8-day clock and electric light, \$40. Standard finish is polished brass, nickel or nickel and black may be had at \$2 and \$3 extra.

Veeder—Veeder Mfg. Co., Hartford, Conn.—These instruments are continued, substantially unchanged. Form D odometer, largely used for electric cars, is of the dash type with total and trip registers and flexible shaft drive; price, \$20. The hub-odometer outfit costs \$20 and bracket-odometer \$10. The tach-odometer is a combined speed indicator and odometer, speed being indicated by the height of a column of liquid; the price is \$50 with attachments for any car. Dealers, 25 per cent.

Standard—Standard Thermometer Co., Boston, Mass.—Standard speedometers have been added to for 1915 by the introduction of a special Ford model. This model is used on Ford cars shipped from the factory as special equipment, bearing the Ford trade-mark, but has not this trade-mark when it is sold through dealers.

The action is centrifugal, the governor on the Standard differing from others in that the equal spacing of the indications is secured, not through a cam action, but

by a rack-and-pinion toggle action. Another feature is the trip odometer, which is a disk back of the dial and showing through an aperture at the lower portion. This dial may be reset to any desired speed to correspond with the trip mileage in the Blue Book when picking up a route when touring. It sells for \$12.

BEARING METAL

Pioneer—Pioneer Brass Works, Indianapolis—Phosphor bronze castings are made in the form of bushings for piston pins and other bearings; also for thrust washers and for any service where speed is high and pressure heavy. Prices, 30 to 35 cents per pound; dealers, 26 to 28 cents per pound.

James Graham & Co., New Haven, Conn.—No changes have been made in the line of babbitt and bronze bearing metals, which are marketed in pigs.

Light Mfg. & Foundry Co., Pottstown, Pa.—Bearing metals are made up in three forms, die castings of plain babbitt and bronze backed babbitt, phosphor bronze and plastic bronze, the former for use with hardened and ground shafts and the latter for softer journals; also sand castings of babbitt. Bronze bearings are carried in stock, but other types are made to specifications.

Lynux—The Aluminum Castings Co., Cleveland—This is a hard bearing bronze for heavy duty and is made in bushings from 1 to 6 inches in diameter and with cores from $\frac{1}{2}$ inch to $5\frac{1}{2}$ inches; all are 12 inches long. Solid bars are also carried in round and hexagon forms. Price, 35 to 45 cents per pound.

Bronshell—Brass & Aluminum Fdry. Mch. Co., Detroit—This line consists of complete bearings with bronze shells and babbitt linings, the layer of babbitt being thin and firmly supported by the bronze backing. Made to specifications only.

Autobronze—Lumen Bearing Co., Buffalo, N. Y.—A full line of bronze and babbitt composition metals is continued unchanged.

Great Western Smelting & Refining Co., 41st and Wallace Sts. and Lowe Ave., Chicago—Babbitt metals are supplied in various grades in bar and ingot form. The company's specialty is nickel babbitt.

PORTABLE GARAGES

Ruby—Ruby Mfg. Co., Jackson, Mich.

—Buildings are made of galvanized metal in multiples of 2 feet from 6 feet to 26 feet width and of any desired length. Each sheet is reinforced the entire distance around with steel angles; the sections come together with tongues and grooves. No bolts are required in the side section, being used only in the ends of the wall and roof. Two models are made, one having an independent frame and the other having the reinforced sheets referred to. Large doors and windows are supplied. An average sized garage can be erected in approximately 5 hours; the only tools required are wrenches to fit the bolts. Prices vary from \$78 to \$2,000. Dealers, 20 per cent.

Edwards—The Edwards Mfg. Co., Cincinnati

—A new product of this company, which manufactures an extensive line of steel garages, is the stucco-steel. In these garages the framework is of wood and the sides of metal studding and lath, and intended to be covered with cement plaster after setting up. The roof may be of steel shingles or metal Spanish tile.

Prudential—C. D. Pruden Co., Baltimore, Md.—These buildings are of steel and are made in sizes from 7½ feet wide up to 30 feet. In the smaller sizes no framing is required, a special method of interlocking producing a rigid structure. Galvanized steel is the only material used and is of 22 and 24 gauge. The list of sizes made is a large one. A popular size is 12 x 20 feet, with gable roof, and the price with one pair of double doors, three hinged wire glass windows 2 x 4 feet, and one service door, is \$209.

Burnham-Standeford Co., Oakland, Cal.

—Wood construction is used throughout and roofs are covered with special roofing material. Garages are made in two sizes, 12 feet 4 inches x 15 feet 4 inches at \$193 and of the same width but 18 feet long at \$223.

Taylor—Taylor Mfg. Co., Montclair, N. J.

—These buildings are of sectional steel construction and are made with interlocking joints. Stiffening ribs are put in every two feet and no independent frames are required, the ribs giving the requisite rigidity. A specialty is a Ford garage 10 x 14 feet, weighing 1,400 pounds. Price, \$180. The time required to erect the garage is about 5 hours and the tools required are a wrench and

screwdriver. The standard garage is the 12 x 18 size, which weighs 2,000 pounds and can be erected in 10 hours. A total of 40 sizes is made, ranging from 10 x 12 feet to 20 x 42 feet, and the prices range from \$166 to \$720; dealers, 25 per cent.

Rusk—The Fargo Cornice & Ornament Co., Fargo, N. Dak.

—These garages are built of metal throughout, the sills being of angle iron and studding plates and eaves stamped from 20 gauge steel; the rafters and trusses are stamped from 22 gauge and the siding from 26 gauge galvanized steel, as is also the roof. All sizes, from 10 x 12 to 20 x 36, are made. The prices range from \$139 to \$480.

O. K. Harry Steel Co., St. Louis

—The sizes made range from 10 to 20 feet long and any width from 8 to 20 feet. They are of metal construction throughout, the sheathing being corrugated. All intermediate seams are double locked and no nails or rivets are used. Windows are of wire glass in metal sash. Roofs are supported by angle trusses. Prices range from \$168 for the 8 x 10 size to \$448 for 20 x 20.

Craig—David Craig, Boston

—A system has been developed for constructing small garages of concrete slabs which are bolted to steel frames. The roofs are of double sheet metal with an air space of 1½ inches and doors are of wood covered on both sides with painted sheet metal. Window frames are of metal with wire glass lights. A feature of the construction is the use of a screw anchor made of coils of wire embedded in the concrete. Only one size is made; it is 17½ x 12½ feet and 8 feet high. It is intended that the garages shall be erected by the manufacturers. Price, \$400.

Karr—Karr Portable House Co., Chicago

—Wood siding is used on these garages, which have steel frames; the lumber is double beaded Georgia pine, varnished inside and painted outside. The floors are of hemlock and roofs of lumber covered with roofing paper. Prices range from \$95 for the 9 x 12 size to \$250 for 20 x 24.

Steel Portable Building Co., Chicago

—These buildings are made in sections 4 feet and 8 feet high, bolted together on the inside through angles. An interlocking seam is used at each joint, making the building weatherproof. A special Ford garage is made which is 9 x 14 feet, weighs 1,500 pounds, and costs \$118. Five hours is the time required

for two men to erect a garage 12 x 20 feet, and the only tools required are wrenches and screwdrivers. Sections are all of uniform size, and windows and doors can be placed in any desired positions by arranging the sections to suit. Prices range from that of the Ford garage up to \$553 for a 20 x 40 garage. Dealers, 20 per cent.

LUBRICATORS

Nyc—New York Coil Co., Inc., New York

—This is a complete oiling system, consisting of a steel tank, 16 x 4 inches, one gallon capacity, clamped to the top of the Ford engine with steel clamps and two of the cylinder head bolts. A copper pipe runs through an oil filling spout at the front of the engine and is secured by a bolt. A valve in the pipe is connected to the emergency brake lever, so that when the brake is set the oil is shut off and when the brake is released the oil is permitted to feed into the crankcase. A sight feed and needle valve are included in the pipe line so that the maximum rate of feed can be adjusted. Only a wrench is required for installation. Price, \$10.

Bosch—Bosch Magneto Co., 225 West 46th street, New York

—These are of the pump type, the plungers being operated by a cam. The cam is a disk which has its periphery concentric with its shaft, but its face is curved. The edge or rim of the cam enters slots cut in the pump plungers and the cam movement causes the plungers to reciprocate in a direction parallel with the camshaft axis. The pumps are ranged in a circle, the number varying from two to eight, according to the number of feeds required. A second cam, similar to the main cam and mounted on the same shaft, but smaller, actuates one piston valve for each pump. Each feed can be individually regulated by means of an adjusting screw. In Types A and AC the worm-shaft, which drives the camshaft, lies lengthwise in the tank and the pumps are vertical; in Type L the camshaft is horizontal and extends through the wall of the tank and is driven directly. Drive may be right or left, rotary or ratchet. No changes have been made.

Pedersen—Pedersen Lubricator Co., New York

—A Ford lubricator has been developed and consists of a ½-gallon oil tank, a small positive rotary pump and an adjustable sight feed. The pump is mounted on the end of the timer shaft and the sight feed is fastened to the en-

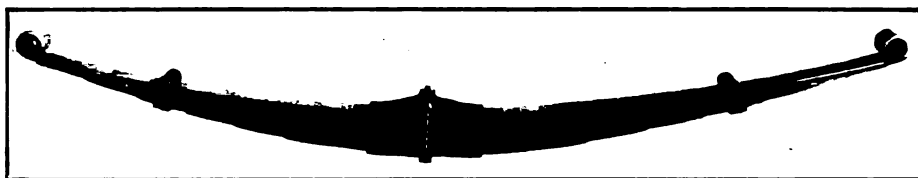
gine head by the timer spring bolt. The pump draws oil from the tank and forces it through the sight feed, from which it goes to the crankcase through the breather. A screw on the sight feed permits accurate adjustment so that a constant level can be maintained in the crankcase. Lubrication starts and stops with the engine. Price, \$7.50. The sight feed glass is on the dashboard, where the feed of oil can be observed at all times.

Detroit—Detroit Lubricator Co., Detroit—These lubricators are made on the double-pump principle, one plunger taking oil from the reservoir and dropping it through a sight feed, and the other taking it from the sight feed chamber and forcing it through its feed pipe; the pumps are valveless. Each pump is individually adjusted from the outside of the oiler case. The plungers are actuated by yokes reciprocated by eccentrics on a worm-driven shaft; drive may be right or left, pulley or ratchet. From 1 to 23 feeds are standard, and special models are made with any desired number of feeds. Prices range from \$10 to \$92 for oilers of the standard types with brass-trimmed iron tanks, and from \$13.50 to \$107.50 with polished cast aluminum or built-up brass tanks.

PISTON RINGS

Micro—Micro Piston Ring Co., 1960 Broadway, New York—This is in reality two rings, a main ring with interfitting stepped joint and a plain-jointed auxiliary ring. The main ring eccentric is slightly larger than the cylinder, has its outer bearing surface uniformly channeled to receive the snug fitting auxiliary ring, which is also larger in diameter than the cylinder and is of practically the same uniform section as the channel. The outer rim of the auxiliary ring forms the bearing surface. By placing the joints of the two rings diametrically opposite, the two rings together expand against the cylinder with much flexibility. Each ring is made from an individual casting of fine grain grey iron.

W. W. Wainwright & Son, Connerville, Ind.—Rings are made to order in all sizes from 1½ to 8 inches in diameter and in any width desired. Rings are made slightly eccentric and cast of a semi-steel mixture. In the finishing process the sides are ground, while the surfaces which come in contact with the cylinder walls are turned in special machines. The theory is that the minute



The Tuthill Titanic spring has no center bolt, the leaves being held in place by upward curves in the centers of the leaves. Graphite lubrication is used

tool marks act as oil carriers and assist the ring in working down to a tight seat. The inner surface is ground sufficiently to clean up the rough casting surface without removing the strength of the original scale. In both grinding and turning the limit of accuracy is set at .00025 inch.

Houpert Machine Co., New York—Piston rings are made to order in any size and any shape from specifications. Individual castings are used and all working surfaces are ground, the inside being left with the skin on to give the ring elasticity. A specialty is made of grinding of all kinds; cylinders are re-finished and new pistons made from a special grade of gray iron.

Tight-Wad—J. Horat, Lafayette, Ind.—Only a single size ring is made, this being the Ford size, 3¼ inches in diameter by ¼ inch wide; they are of the three-piece type with joints equally spaced and are concentric. Price, \$1.25 each or \$5 per set of four.

Teeter-Hartley Motor Co., Hagerstown, Ind.—Rings are made of all diameters from 1¾ to 7½ inches and from ⅜ to ⅝ wide. Both concentric and eccentric designs are turned out.

SPRINGS

Titanic—Tuthill Spring Co., Chicago—All types of flat leaf springs are made to manufacturers' specifications. The Titanic spring has no center hole, the leaves being held in place by curving the centers upward, which prevents longitudinal motion, and by using yokes and bolts preventing lateral displacement, thus eliminating the possibility of fracture at the center. The plates are lubricated by a mixture of graphite and grease. Special springs are made for practically all the cars on the market.

Detroit—Detroit Steel Products Co., Detroit—All types and sizes of springs are made. Improvements consist in the adoption of a self-lubricating device which consists of a small depression or

cup stamped in the tip of each leaf and filled with a graphite paste. Center bolts are eliminated by a series of nibs and hollows, holding the leaves in perfect alignment. Springs are not carried in stock, but are made to specifications and are designed especially for the cars on which they are to be used.

Hess-Pontiac—Hess-Pontiac Spring & Axle Co., Pontiac, Mich.—All springs are made to manufacturers' specifications and are not carried in stock. Springs are made for most of the standard cars on the market, and are provided with special means of lubrication between the leaves. Special attention is being directed to the cantilever type.

Liggett Spring & Axle Co., Monongahela, Pa.—Springs are manufactured to manufacturers' specifications only and are not carried in stock. All details, including method of lubrication, are specified by car builders.

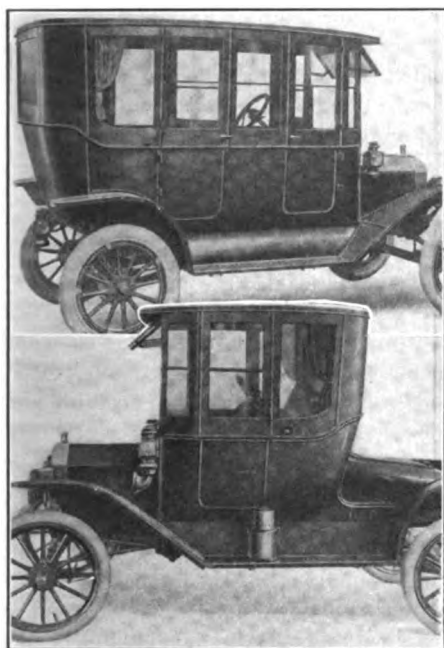
The Western Spring & Axle Co., Cincinnati, O.—All types and sizes of springs are manufactured and are sold direct to car builders. The only changes or improvements that have been made are in manufacturing processes and in materials; the greatest improvements have been made in heat treatment.

Garden City Spring Wks., Chicago—This spring suspension is a combination of cantilever and coil springs, the cantilever being backed by the coil. A special model for Ford cars has been designed to take the place of the regular Ford springs and includes a pair of leaf springs pivoted to a casting placed in the frame at the point of attachment of the old spring. The two coils are held in place by lugs. The makers state that the period of vibration is reduced to 90 per minute, which is about half the rate of the regular Ford spring. No machine work is required to attach these springs and the wheels need not be removed from the car.

Hess—Hess Spring & Axle Co., Carthage, O.—Springs of conventional design are manufactured in all sizes and

capacities and with various types of eyes and connections. Cantilever springs are being given special attention and are manufactured, like most of the others, to specifications. Graphite is used as a lubricant.

Harvey—Harvey Spring Co., Racine, Wis.—All types of springs are manufactured for both light and heavy service. The types manufactured in the past are continued with such detail improvements as have been suggested by experience. Improvements in material and its treatment have resulted in a substantial increase in fatigue life. All springs are designed on the theory of bending moments to develop uniform fiber stresses

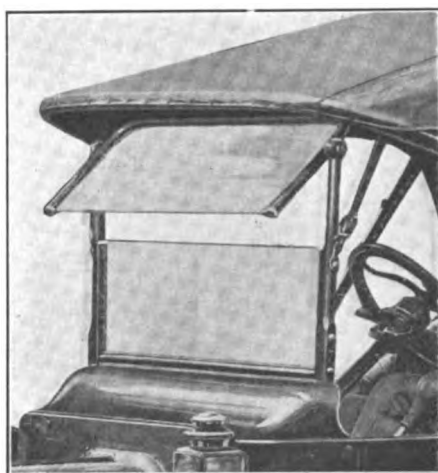


Swan enclosed bodies can be attached to any Ford model T with little labor

by the proper shape and distribution of material. Graphite and oil are used for lubrication.

BODIES

Storm—Storm Buggy Co., Fostoria, O.—A Ford sedan body is built which is complete and includes a tapered motor hood; the rear seat accommodates three and the front seat two, all inside. There are three doors, two rear and one front, the latter on the right. Interior width, 44½ inches; height 56 inches. Wood framing is covered with sheet metal. Windows are of heavy glass set in rubber tape. A ventilating windshield is fitted. Linoleum-covered aluminum bound runningboards are part of the equipment. Body attached without chassis changes; gasoline tank goes under



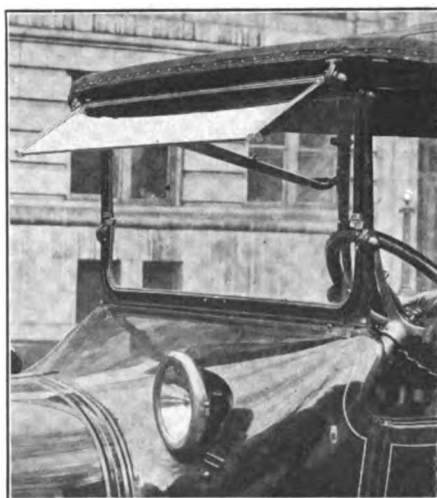
The Vanguard windshield attachment permits clear vision and good ventilation on Fords

sedan seat without moving it. The makers state that the weight of the body is 500 pounds, the car weighing 1,620 pounds with sedan in place. Price, \$350.

Swan—Swan Demountable Body Co., Cleveland—A special body superstructure has been designed for converting a Ford car into an enclosed car, and a smaller type is built for the runabout. Both bodies are carefully fitted and can be put on and taken off without difficulty. The weight added to the touring car is 50 pounds, and the runabout 30 pounds. The finish is the same as that of the regular Ford car. The front is provided with a windshield of the clear-vision type; the doors swing with the car doors. The interior upholstery matches that of the car. Silk curtains are draped at the windows. Price, for touring car, \$150; for roadster, \$90.

WINDSHIELDS

Fryer-Auster Tonneau Shield—Fryer-Auster Co., Providence, R. I.—This com-



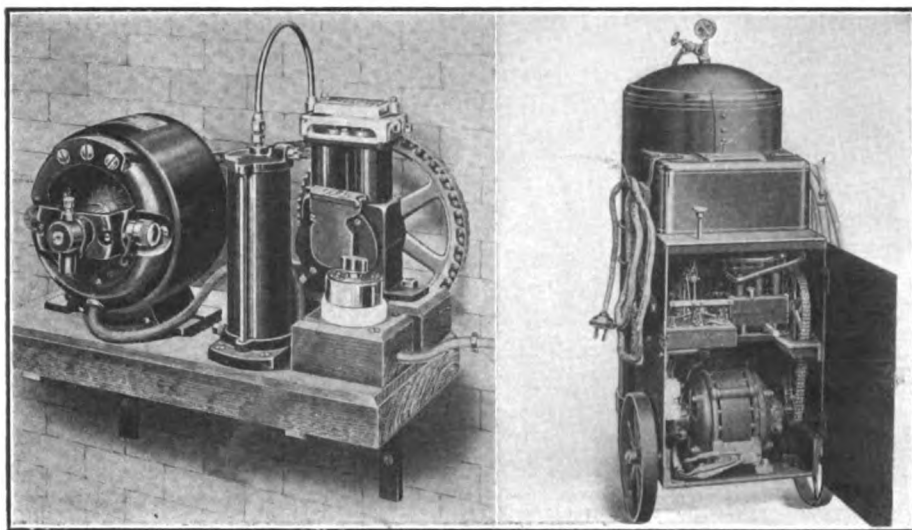
The Roadview shield visor hinges to the front of the top and protects the windshield

pany makes a tonneau shield to protect the occupants in the rear seat. It is adjustable to any required position and is attached to the rear of the front seat, where it is folded when not in use. It consists of three sections of one-pane glass frames mounted on two arms extending out from the rear of the front seat. The side windows or wings fold when not in use. These arms are pivoted at their center for placing the shield in any required position. They are connected to the front seat by means of an upright bracket, from which they are swung either in or out. The connection at the shield end consists of a screw adjustment, or locking hinge, from which the shield may be placed at any desired angle. During winter the occupants are protected by an apron of heavy waterproof twill, which protects them from underdraught and keeps the robes dry and clean. The price of the shield is \$75 f. o. b. Providence.

Pla-Safe—Banker Wind Shield Co., Pittsburgh, Pa.—An attachment has been brought out making the Ford windshield fully adjustable. It consists of a hinge designed to replace the Ford hinge and is attached by the same screws that held the original. Attachment does not necessitate the removal of the windshield from the car and requires no special tools. The windshield can be adjusted both vertically and horizontally for rain-vision and ventilation. Price, black enameled steel, \$3.75. Discount, up to 10 sets, 25 per cent; to 25 sets, 30 per cent; to 50 sets, 33⅓ per cent; to 100 sets, 45 per cent.

Douglas & Lomason Co., Brooklyn avenue and Belt Line, Detroit—Double panel clear vision automatic, \$30 to \$32, according to finish. Single panel automatic, \$15 to \$17; with ventilating adjustment, \$17 to \$19. New model 57, adjustable to all positions, of solid brass tube, bronze castings, French plate glass and mahogany filler board, brass finish, 12 x 14 x 40 glass, \$25; 14 x 14 x 40, \$26.50; 14 x 14 x 44, \$30; nickel, \$2 extra. Douglas & Lomason lock on all models.

The Troy Carriage Sunshade Co., Troy, O.—Windshields are not made in standard models any more, but in special forms to fit certain cars. Practically all are of the two-piece type with rain-view and ventilating arrangement, black enamel with steel frames and drop forged fittings. They are all designed to be built into the dash or cowl, the car being ironed and the shield supports made to fit the irons exactly. The entire out-



Left—Kellogg stationary outfit EM 12 with motor and 2-cylinder pump. Right—Model EM 36 which is entirely enclosed and has a six-cylinder pump with cylinders in pairs

put of the factory is sold to car manufacturers.

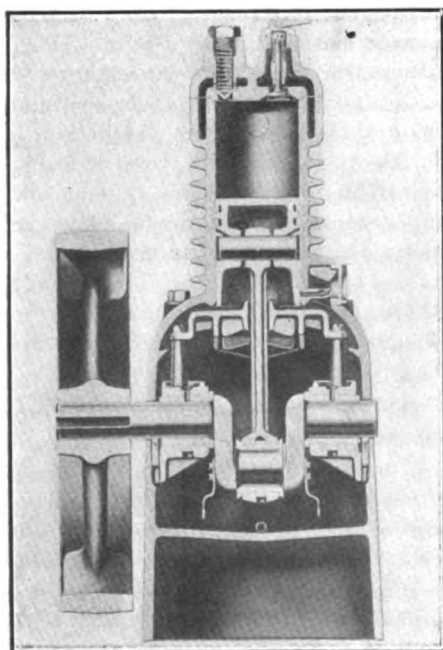
English & Mersick—English & Mersick Co., New Haven, Conn.—A two-pane windshield. Both shields can be turned in any direction. Four thumb nuts, two on each side of the shield, hold the panes in position. The frame, which is of wood construction, has two connections for tops.

Beatonson—Sharrer Patent Top Co., New York—This is a shield of the tonneau type and is attached to the back of the front seat by means of extension brackets. It is made in three folding sections, a long middle section and two shorter side wings, which can be set at any angle or can be folded down flat

against the back of the seat. From the bottom of the shield hangs an apron of waterproof fabric. The shield is supplied in one size, having a total frame width of 62 inches; the extensions are 24 inches long. Price is \$65, including attachment to car.

Rands—Rands Mfg. Co., Detroit.—Windshields are manufactured in quantities to car builders' specifications only. All are built especially for the cars on which they are used and stocks are not carried.

Roadview Shield Visor—Joseph N. Smith & Co., Detroit—This is a visor-like attachment designed to be hinged to the front bow of the top. It is of plate glass with steel frames at the ends. Two stock sizes are made, 8½ inches wide by 30 inches long, \$5; 8½ inches wide by 41 inches long, \$5.50. The projecting glass protects the windshield from rain.



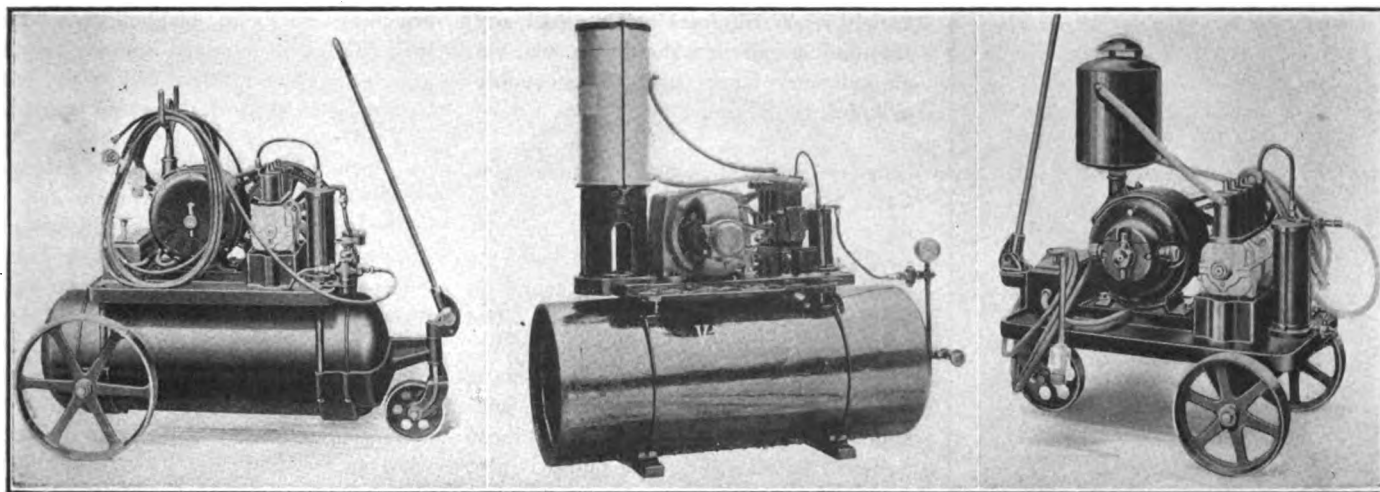
Curtis single-cylinder heavy-duty air compressor, enclosed type, for belt drive

ing mounted on the truck. The drive is through ¼-horsepower motor through covered silent chain. Pistons are operated by cams; cylinders are of iron and are lubricated by splash. Dimensions, 16 x 24 x 28 inches high; weight, 125 pounds. Price, direct current, \$92; alternating current, \$102. Equipment, 10 feet electric cable with socket and plug, 15 feet air hose, air gauge, air filter and knife switch. Model Em-44 has the same pump and motor equipment mounted on top of a horizontal air receiver 10 x 30 inches. Working pressure, 200 pounds. Dimensions, 17 x 37 x 33 inches high; weight, 185 pounds. A 200-pound tank gauge is supplied. Price, direct current, \$115; alternating current, \$125. Model Em-36 is of the completely enclosed type and is portable, having a vertical air receiver 16 x 40 inches, to which is attached a housing carrying the motor, pump and gearing, the whole being mounted on three wheels. The pump has six cylinders, 1½ x 1 7/16 inches, mounted in pairs so that the length is that of three cylinders driven through silent chain by a 1-horsepower motor. An automatic electric cut-out shuts off the current when the pressure reaches 200 pounds. Dimensions, 24 x 36 x 48 inches high. Weight, 400 pounds. Complete equipment. Price, \$230; with single phase or direct current motor enclosed, \$240. Model Em-16 includes the same parts as Em-36, but is stationary, and the air receiver is horizontal. Price, \$190; with single-phase or direct-current motor enclosed, \$200. Model BD-14 is a four-cylinder pump on a stationary base with driving pulley; cylinders 1½ x 1 1/16. Price, \$35. Model BD-16 consists of a six-cylinder pump with water tank and air filter mounted on a stationary base for belt drive and connected with a separate air receiver. Prices vary according to size of air receiver.

AIR COMPRESSORS

Kellogg—Kellogg Mfg. Co., Rochester, N. Y.—A number of models of stationary and portable garage outfits are built. Model Em-12 consists of a 2-cylinder pump 1½ x 1 7/16, of all-metal construction, driven by a ½-horsepower motor through sprockets and chain, the whole mounted on a substantial base and designed to be bracketed on a wall or placed on the floor. Weight, 75 pounds; dimensions, 11 x 19 x 14 high. Equipment, 15 feet of air hose, gauge, air filter and 4-pole snap switch. Price for alternating current, \$80; for direct current, \$70. Model Em-34 is portable. The pump has four cylinders 1½ x 1 1/16 inches and is water-cooled, the tank be-

General Utility Co., Philadelphia.—Three models are made. Model E-I and F-I are similar except that the latter has an air receiver 12 x 24, while the former has none. The air pump is of the two-cylinder horizontal type with air-cooled opposed cylinders ¾ x 3, with automatic semi-splash oiling, driven by a ½-horsepower electric motor through gears. The motor may be either direct or alternating. In each case the outfit is mounted on a substantial base on wheels. The outfit includes pressure gauge, hose, electric cable, starting switch and oil separator. Price, with tank, \$165; without tank, \$150. Model N is a smaller compressor with a four-



Left—Kellogg model EM 44 with 4-cylinder water-cooled pump, $\frac{1}{2}$ h. p. motor and air receiver. Center, stationary outfit with water-cooled pump and automatic cut-out. Right—4-cylinder garage outfit on three-wheeled truck without air receiver; air is pumped direct to tires

cylinder pump driven by $\frac{1}{4}$ -horsepower motor. It is mounted on a base on wheels and all parts are of metal. The pump cylinders, which are air-cooled, are $1 \times 1\frac{3}{8}$. It is designed to pump directly into the tire, there being no tank. Price, with gauge, hose, electric cable, starting switch and oil separator, \$90. Jobbers, $33\frac{1}{3}$ per cent.

Curtis — Curtis Pneumatic Machinery Co., St. Louis—These compressors are of the up-plunger type and are made in four sizes, $1\frac{1}{2} \times 2$, $2 \times 2\frac{1}{2}$, $3 \times 3\frac{1}{2}$ and $4 \times 4\frac{1}{2}$ inches, and are designed for pressures up to 250 pounds. All but the largest are air-cooled, though the $3 \times 3\frac{1}{2}$ -inch size is also made with water jackets. All are of the enclosed type and equipped with a special lubricating system. The oil is not splashed but an ample supply is provided wherever there is friction. All models are designed for belt drive and are supplied with or without air receivers.

Alding—Cast Iron Brazing & Mfg. Co., Manchester, N. H.—This outfit is of the two-unit type, the compressor being stationary and the air tank portable, mounted on rubber tired wheels. The method of operation is to wheel the air tank to the compressor, charge it with air and then take it wherever it may be required. The pump has two opposed cylinders with a bore of $1 \frac{15}{16}$ inches and will pump up to 200 pounds. Drive is by belt, the machine being equipped with tight and loose pulleys $15\frac{1}{2}$ inches in diameter. The power needed is 1 horsepower. The portable tank is 12×44 inches, of seamless steel, and is tested to 600 pounds. It is mounted horizontally and is equipped with two gauges, one for showing the pressure in the tank and the other the pressure in tire; a valve gives full

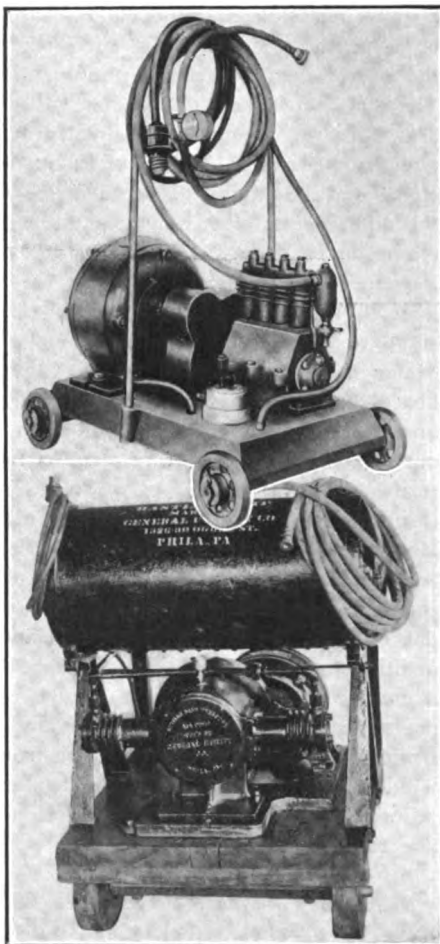
control of tire pressure. Price of the pump alone is \$32.50; portable tank with gauges and hose, \$37.50; jobbers, 25 per cent.

Caldwell Junior—H. S. Caldwell & Co., Inc., New York—A single outfit is built of the portable type. The pump has four cylinders $1\frac{1}{4} \times 1\frac{1}{8}$, lubricated by splash. It is driven by a direct-current motor of

$\frac{1}{6}$ horsepower or an alternating-current motor of $\frac{1}{4}$ horsepower. An air receiver 6×20 is mounted on the same base, and the outfit runs on wheels. The motor is mounted at one end of the base frame and the receiver at the other, with the pump on a bracket sufficiently elevated for the pump gear to be above the motor pinion. The maximum pressure is 150 pounds. Price, with direct-current motor, \$65; alternating-current motor, \$75. Built as a stationary outfit, \$5 less. The outfit includes rubber hose, pressure gauge and electric cable.

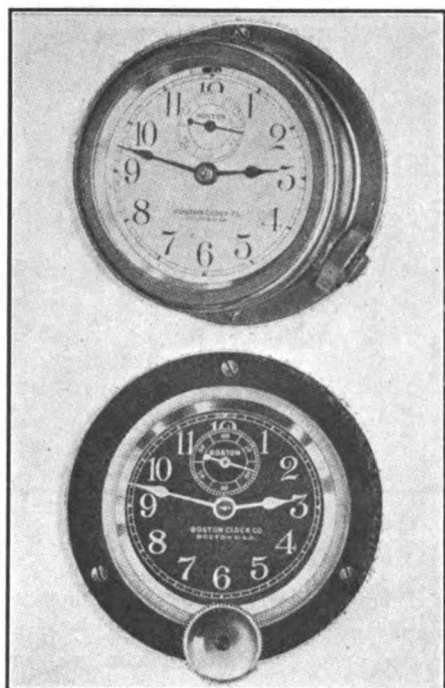
Gardner — Gardner Governor Co., Quincy, Ill.—Three air-cooled and two water-cooled pumps are made, all single-cylinder machines, with automatic splash lubrication, working up to 200 pounds. They are designed to be driven by motors. Air receivers are supplied with pumps. The small pump for private garage service is mounted with a $\frac{1}{4}$ -horsepower electric motor and will fill a 36×4 tire to 90 pounds in about $2\frac{1}{2}$ minutes. Weight of pump alone, 25 pounds.

De Launty—Simplex Mfg. Co., 1507 Great Northern Bldg., Chicago—This is a combined power tire pump and starting crank for Ford cars. A single-cylinder pump is made integral with the starting crank, the drive being through a central shaft inside of the starting crankshaft. The fitting can be installed in one hour, no machine work being necessary. A small knurled knob connects the pump shaft to the end of the crankshaft through a dog clutch. The pump is furnished with 12 feet of hose, connections and gauge, \$10; for larger cars, \$12.



Upper—General Utility model N, 4-cylinder. Lower—Stationary outfit model E 1 with opposed cylinder pump

Folberth — Folberth Auto Specialty Co., Cleveland—This pump is of the pis-



Boston clocks are of the inset type and have stem winding and setting

ton type and is installed on top of the engine cylinder with the pump piston rod extending downward and resting on top of the motor piston. Both the intake and discharge valves are in the cylinder head. The upward or compression stroke of the pump is caused by the upward pressure of the engine piston and the return stroke is due to suction, there being a pipe by means of which the lower part of the pump cylinder is placed in communication with the intake pipe of the engine. The cylinder has a bore of $1\frac{1}{2}$ inches and the stroke is that of the motor to which it is attached.

Tri-Phoon—Green & Swett Co., Boston—The pump supplied with this outfit has three cylinders, arranged in a compact group, with their axes parallel and equidistant, eliminating the usual crankcase. Drive is through a gear on a shaft parallel with the cylinders and in the center of the group of three. The pump is mounted on a low truck and driven by an electric motor of $\frac{1}{4}$ horsepower. At a speed of 800 r. p. m. the pump will operate at 150 pounds pressure. Equipment includes hose, gauge and electric cable.

National—National Brake and Electric Co., Milwaukee—These pumps are of the stationary type and are designed for belt drive. They are enclosed, lubricated by an oil pump and have large bearings, long pistons and poppet valves. Four sizes are made, ranging from $3\frac{3}{8} \times 3$, single-cylinder, to $4 \times 4\frac{1}{8}$ double-cylin-

der. Prices, single-cylinder, small size, \$75; double-cylinder, small size, \$85; single-cylinder, large size, \$150; double-cylinder, large size, \$160.

Smith—Irvin C. Smith, Los Angeles, Cal.—This is a single-cylinder air-cooled pump designed for belt drive. The bore is $2\frac{3}{8}$ and the stroke $1\frac{3}{4}$ inches; the piston is fitted with three rings and all working surfaces are ground. The crankcase is of the enclosed type and lubrication is by splash; an automatic valve prevents overloading. Price, with single pulley, \$35; with tight and loose pulleys, \$37.50. The same pump is also mounted on a stationary base with electric motor drive through sprockets and chains. Price, \$135.

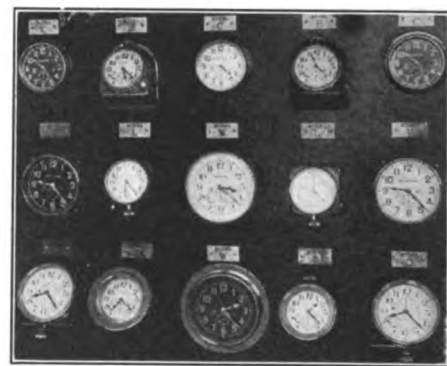
CLOCKS

Waltham—Waltham Watch Co., Waltham, Mass.—The most recent product is a special truck clock mounted in an off-set case which is waterproof and thief-proof. It runs 11 days on one winding and has an indicator on the dial which gives warning three days before rewinding is required. The winding crown is always accessible, but the hands cannot be set without the use of a special key, the object being to prevent tampering. The dial is 3 inches in diameter. Price, \$25. Pleasure car clocks are divided into two groups, one consisting of limousine clocks and the other of dashboard clocks; the difference is chiefly in the matter of mounting, as the type and quality of movement is the same in both cases. Special models are made for a number of standard cars. The Cadillac Model C, designed to be mounted on the cowlboard, has a black face with white figures. It is mounted flush, but springs out for winding and setting on a partial turn of the rim; the key is a fixture and is normally folded flat. The dial may also be had white or silvered. Price, \$25. Model B, for closed cars, is offset in a case having a rounded top and flat bottom; the crown is brought into position for winding by giving the bezel a quarter turn. Model E is a type especially adapted for installation on the front of a toilet case or above the front window of a closed car. All models are adjusted to temperature and are not affected by vibration.

Waterbury — Waterbury Clock Co., New York—These clocks have outside hand set, screw bezel and bevel glass in all models and are practically dust and waterproof; special devices are used for

attaching clocks to dashboards so that they cannot be removed without the use of a special key. Clocks can be had with gunmetal finish and the bezel and outside trimmings of nickel or brass. Prices, Florida model, winds, regulates and sets from outside, $2\frac{1}{2}$ -inch porcelain dial, 4-inch flange on back for dashboard attachment, \$5; dealers, \$3.50. Suwanee key wind, $2\frac{1}{2}$ -inch porcelain dial, rectangular tilted dashboard case, \$5 and \$3.50. Tarpion, same model but bezel wind, \$6.50 and \$4.75. Pensacola, $2\frac{1}{2}$ -inch porcelain dial, round tapered case, key wind, \$5 and \$3.50. Orlando, same but with bezel wind, \$6.50 and \$4.75. Clocks with jeweled movements include the Ocala, key wind with round case, \$6.50 and \$4.75, and its bezel wind counterpart, the Arcadia, \$9 and \$6; the Tampa, rectangular tilted case, key wind, \$6.50 and \$4.75, and the Palatka, the same model with bezel wind, \$9 and \$6. All have eight-day movements.

Stewart - Warner — Stewart - Warner Speedometer Corp., Chicago—The newest Stewart accessory is a 1-year self-winding electric clock. This clock is of the flush type designed to be countersunk into the dash, and carries a small

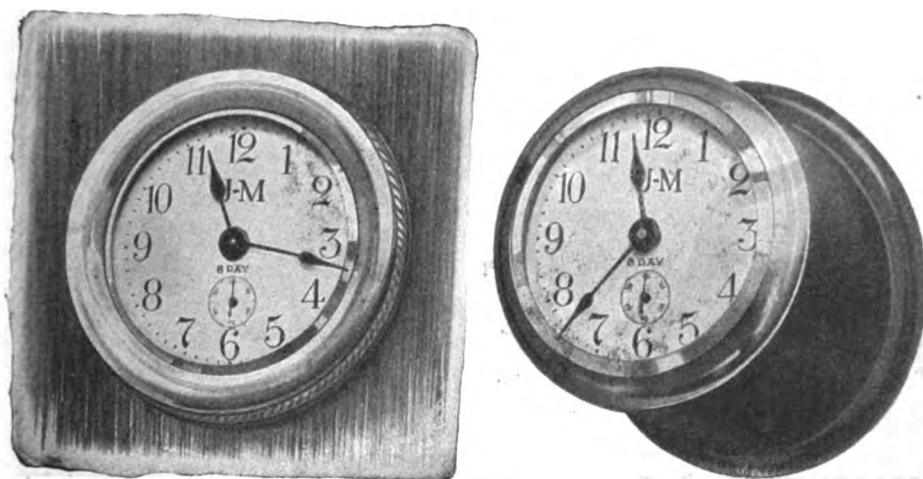


Part of the complete line of Waltham clocks with eight-day adjusted movements

dry-battery at the back. It consists of a standard clock, but having only a very short coil spring. A contact maker closes the battery circuit once every 2 minutes, the current energizing a magnet whose armature rewinds the spring. The clock requires no attention whatever except the renewal of the battery once a year.

Another new product is a special truck model of the Stewart hand horn, the bracket of which is so arranged that it may be adjusted to three angles. It is also somewhat heavier than the passenger vehicle model.

Octavo—Hipp, Didisheim & Bro., New York—Two clocks are made especially for motor truck service, both having



The J-M has an 8-day Ansonia movement and all holding screws are hidden. Left shows flush type and right the extended type

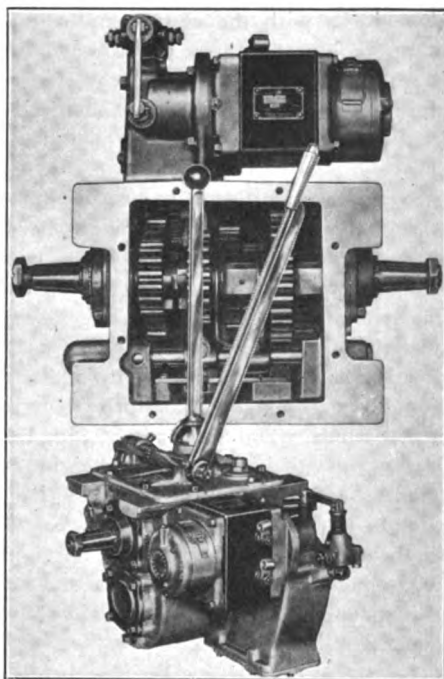
watch movements. The 8-day movements are alike in both, having 15 jewels, cut balance, Breguet hair spring; they are bridge models throughout, adjusted, and have double sunk enamel dials. Cases are of German silver with dust caps, and the cases are fitted into large containers which are of various shapes, according to the location of the clock in the car. In the dash type, the casing is of heavy polished brass and may be had also in nickel plated or with gunmetal finish. Containers are lined with velvet and heavily padded, with heavy screw flange and plate glass crystal. A small set-screw holds the flange in place. Price, \$25; dealers, 50 per cent. With the flush type of container the price is \$20; dealers, 50 per cent. In any model the dial may be silver-plated or black enamel with white numerals at a small extra cost.

Boston—Boston Clock Co., Boston—Complete line of flush insert and stem winding and setting clocks is continued. A new model consists of an electric clock which does not require winding. The details of this have not yet been revealed, but it is stated that the mechanism is simple and reliable. The clock is of the flush type.

Minot—Turner Electric Supply Co., Birmingham, Ala.—This is of the rim wind type with 8-day movement, 2-inch silver dial with second hand and rim set. The winding and setting parts are assembled in the movement and are not connected with the case in any way. They are fitted with black dials and white numerals and in black enamel cases with nickel rim, all nickel or all brass. Both flush and outside types are made and the same general type of clock is supplied with 3- or 4-inch dial.

J-M—H. W. Johns-Manville Co., New York—These are made in two types,

flush and extended, and both have the same Ansonia eight-day movement, the dials being 3 inches in diameter. They are finished in black and nickel and black and brass and all fastening screws are hidden. The clock portion is held in the case by means of a bayonet lock. Price, either style, either finish, \$5.



Upper, Brown-Lipe new model with Westinghouse electric starter mounted in unit. Lower, the starter side of the same assembly

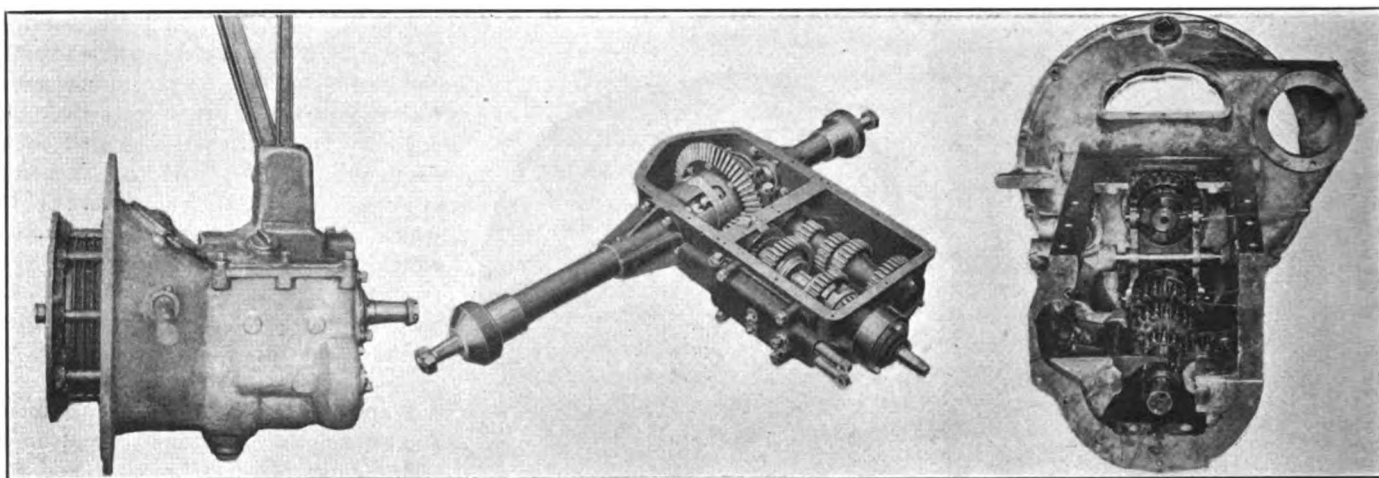
GEARSETS

Brown-Lipe—Brown-Lipe Gear Co., Syracuse, N. Y.—Only detail changes have been made in the gearsets, which are being carried over as a complete line. A new model is being produced, however, on which the Westinghouse electric starter is mounted in unit and connected so that the starter drive is through the gearset; the object of this construction is to

relieve the congestion of accessories on the motor. Further, it is possible to start and permit the motor to gain speed before engaging a clutch to turn over the engine. The starter is operated by a foot button and the gears are automatically released when the engine takes hold, which arrangement eliminates roller clutch. The design of this combined unit is such that any gear reduction can be used so that the outfit can be installed in either four- or six-cylinder motors.

Warner—Warner Gear Co., Muncie, Ind.—Gearsets are manufactured in a wide range of sizes, suitable for the lightest cars and the heaviest trucks, in unit, sub-frame and rear axle type. Gears are of carbon or alloy steel, heat-treated and ground. Sliding gears are automatically locked in and out of mesh and bearings are either annular ball or roller types. In the unit types the clutch is carried in the housing integral with the gearbox; the clutch may be dry, oiled or with cork inserts, of the disk type. Unit gearsets have stock size flanges for all standard motors, and are built in quantities with special flanges. The smallest model is for cars of 20 to 35 horsepower and is arranged for center control; annular ball bearings are fitted. It is built for both unit and sub-frame construction. For cars of 30 to 40 horsepower a sub-frame gearset is built, having right-hand control and ball bearing shafts. For 40 to 50 horsepower cars a unit type model is built having dry-plate clutch, center control and Timken roller bearings. The largest pleasure type, for cars up to 60 horsepower, is for sub-frame construction and has four speeds. Gears are of five pitch and 1-inch face, control center, direct drive on third.

Grant-Lees — Grant-Lees Gear Co., Cleveland—The latest model is a three-speed gearset designed to transmit 25 horsepower at 1,600 r. p. m., the figure being based on using a motor $3\frac{1}{4} \times 5$. The gears are $3\frac{1}{2}$ per cent nickel steel and the shaft of 1 per cent nickel steel. An improvement consists in the use of a double row of annular bearings on the main driveshaft instead of single row bearings. The gearbox is of aluminum and the unit weighs 43 pounds. A forward extension of the case is machined for attachment to crankcase for unit construction. Shifting and emergency brake levers are carried on a plate on top of the gearcase, the shifting lever working with a ball and socket joint. The brake lever is not regular equipment, but is furnished at an extra charge, and



Left—Fuller three-speed gearset with multiple disk clutch. Center—Driggs-Seabury heavy truck type with jackshaft and differential in unit. Right—Ross constant-mesh system, in which driven pinion slides from gear to gear without unmeshing

the same is true of the clutch, which may be either disk or cone. The main driveshaft is finished according to the customers' specifications.

Fuller—Fuller & Sons Mfg. Co., Kalamazoo, Mich.—A new model has been brought out designed for unit power plant construction; has three speeds, center control and regularly fitted with a disk clutch with Raybestos facing. Gears are $\frac{7}{8}$ face and 6-8 pitch made of $3\frac{1}{2}$ per cent nickel steel. Shafts are hardened and ground and mounted on annular ball bearings. The gearset is intended for cars from 20 to 40 horsepower and for trucks up to 1-ton carrying capacity. The shifting lever and emergency brake lever are mounted on the cover plate; the gear lever is of the ball and socket type and is surmounted by a hard rubber ball handle. This gearset may be had with the levers mounted directly over the casing or on an extension carried backward so that the lever positions can be suited to the construction of the car.

Ross—The Ross Transmission Gear Co., Detroit—This gearset is of the sliding type in which a single gear on the final shaft slides from one to another of a cone of gears without at any time being out of mesh and without interrupting the delivery of power. The cone is on the countershaft and is driven by a gear on the primary. It carries three gears for first, second and third speeds, and between the first and second and the second and third are eccentric gears. At the smallest diameter, the teeth of the eccentric gears correspond exactly with those of the smallest gear adjoining, while the teeth on the larger diameter correspond with the teeth of the adjoining larger gear. The final shaft is universally mounted and can move in any direction. The changes of speed are ef-

fected in going from low to high by sliding the gear on the final shaft off the driving gear and on the eccentric gear at the instant when the teeth of the two correspond. It is mechanically guided both as to eccentric movement and time of shifting so that it is not possible to make an error in this respect. For high speed a clutch on the universal shaft locks with the clutch on the primary, giving direct drive. The gear lever is set in anticipation of the gear change and the actual shift is made automatically by a spring.

Syracuse Gear Co., Syracuse, N. Y.—A specialty is made of a planetary gearset with two speeds, built for either chain or shaft drive. Gears are cut from solid bar steel and hardened in oil; the case is oil-tight. A double plate clutch is used, double acting, with adjustment for wear. Four sizes are made; No. 2, for cars up to 1,000 pounds, weight 40 pounds, \$60; No. 3, cars up to 1,800 pounds, weight 50 pounds, \$70; No. 8, cars up to 2,800 pounds, weight 80 pounds, \$100; No. 4, for heavy cars and 3-ton trucks, weight 100 pounds, \$125. Selective gearsets are also made in a wide range of sizes and capacities.

Lefever—Lefever Arms Co., Syracuse, N. Y.—Four models of axle gearsets are produced. Model 0900, to transmit from 10 to 15 horsepower, has two speeds forward and is of the progressively operated type. Weight, 25 pounds; gears, 7-9 pitch; secondary gears integral with countershaft. Mounted on ball and roller bearings. Model 1800, three speeds, to transmit from 15 to 20 horsepower, for cars weighing not over 1,800 pounds. Operation is selective, the main shaft runs on roller bearings. Model 0600 is similar to Model 1800 except that it has a differential carrier integral with the

gearbox. Model 0600, three speeds, 20 to 30 horsepower, for cars up to 2,700 pounds, has nickel steel gears, $\frac{3}{4}$ -inch face, 6-8 pitch. The main shaft runs on ball and roller bearings and the countershaft on ball bearings. Model SD 101-200 is a combined three-speed gearset and jackshaft; operation is selective. Unit is designed for trucks up to 1,500 pounds capacity and will transmit up to 25 horsepower. Shafts run on ball and roller bearings. Model RD 100 is a planetary gearset in unit with a jackshaft and is designed for light trucks carrying not over 1,500 pounds.

Rochester—Rochester Motors Co., Inc., Rochester, N. Y.—No changes have been made in these gearsets and no new models have been added; the only improvements consist in the use of better material. Type U. S., a three-speed gearset for unit construction, is designed for cars from 2,000 to 3,000 pounds; three truck gears are made, suitable for $1\frac{1}{2}$ -, 3- and 5-, or 7-ton trucks, adapted for either chain or shaft drive. All have three speeds. The truck gearsets have iron cases and Timken bearings throughout. Hyten steel is regularly used for gears but other steels will be used upon specification.

Cotta—The Cotta Transmission Co., Rockford, Ill.—These gearsets are all of the heavy duty type and the gears are engaged by individual sets of jaw clutches which are automatically engaged when the control lever is set for the desired speed. On high speed, the drive is direct and the countershaft and all main shaft gears are idle. Gearsets are made for both chain and shaft drive. Chain drive gearsets have differentials in a gearbox extension; they are built for trucks from $1\frac{1}{2}$ to 8 tons carrying capacity and all have three speeds. The shaft

drive gearsets are made in the same sizes and capacities and also have three speeds. In both shaft and chain types all models have a low-speed ratio of 4 to 1, second speed, 2 to 1, and direct drive of 1 to 1. In the two smaller chain models, suitable for trucks of $\frac{1}{2}$ to $1\frac{1}{2}$ tons, and 1 to 2 tons, the reduction is 3.2 to 1. In the two models for trucks from 2 to 3 and 3 to 5 tons the reduction is 3.07 to 1 and in the largest model for trucks from 5 to 8 tons it is 3 to 1. No plain bearings are used; gears that run idle are mounted on roller bearings. Special units can be furnished for use with standard axle and jackshaft equipment and for unit power plants.

Warner—Warner Mfg. Co., Toledo, O.—Both three- and four-speed gears for unit, independent and rear axle construction are made. Model 196 is for cars under 1,200 pounds having motors of approximately 100 cubic inches displacement. The main shaft runs on annular ball bearings and the clutch has a double row of ball bearings to take the spring thrust and radial load. Controls are directly on the transmission cover. The clutch is a 10-inch cone with springs under the leather. Model 208 is of the same general construction but has a dry-plate clutch and is somewhat larger, being suitable for cars up to 2,200 pounds with motors of 200 cubic inches displacement. Both these models are designed for unit construction, as is also Model 303, which, however, is suitable for motors having 280 cubic inches displacement; the construction is heavier throughout, the clutch is a cone, and two spring plunger brakes are provided to prevent spinning. If desired, a dry-plate clutch may be used instead of the cone. Model 181 is for cars up to 4,000 pounds with 60-horsepower motors, though it is sufficiently light for use on less powerful cars. Direct drive is on third, the fourth being a 20 per cent over-step. Model 199 is of unusually heavy construction and has large bearings; it has three speeds and is suitable for cars up to 4,000 pounds. Model 197, four speeds, can be had with direct on either third or fourth.

Driggs-Seabury—Driggs-Seabury Ordnance Corp., Sharon, Pa.—Heavy-duty gearsets of the selective type are built for trucks of one-, two-, three- and five-ton capacity and a progressive gear for seven-ton trucks. All are designed for three-point suspension. The one-ton model is designed to transmit 20 horsepower at 1,000 r. p. m.; the gear ratio on high is 2.44 to 1 and on low 7.45 to 1. The two-ton transmits 28 horsepower,

has a high speed ratio of 2.5 to 1 and low speed 9.15 to 1. The three-ton transmits 40 horsepower; high speed 2.5 to 1, low 9.6 to 1. Four-ton transmits 52 horsepower; high speed, 2.52 to 1; low speed, 10.4 to 1. Five-ton transmits 68 horsepower; high speed, 2.52 to 1; low speed, 10.4 to 1. Jackshafts and housings are furnished bolted to gear boxes on order.

B-T-K—B-T-K Gear & Engine Co., Muncie, Ind.—No changes have been made in this line. The smallest model is a three-speed gear for independent mountings. The shafts run on taper roller bearings and are short and rigid. It is intended for small cars; the larger model along the same lines is for cars of from 35 to 40 horsepower. A 60-horsepower gearset for heavy touring cars or light trucks is the heaviest in the line. Gearsets in heavy and light types are built with cone or disk clutches.

WHEELS

Dunlop—Dunlop Wire Wheel Corp. of America, New York—Detachable wire wheels are furnished for any standard axles and for any size standard sized tires used on pleasure cars, so that they can be attached to any standard make or model car without making any changes. The distinguishing features of the wheel are the method of lacing the spokes and the automatic locking device. The spoke lacing is of the quadruple type. Each wheel contains 70 spokes. The inner series is at right angles to the axle, and the outer series at a considerable angle. Between them is a third series which acts as a diagonal brace. Strictly speaking, there are four series of spokes, for, of the outer series, half are set further in than the others. This spoke arrangement permits a dished wheel effect. The locking hub has a wheel nut with locking teeth which mesh with corresponding teeth in the shell. A special wrench is provided for the hub, and when the wrench is removed, the wheel is automatically locked and cannot be removed until the wrench is applied. A complete set of five wheels, black enamel with brass or nickel hub cap, any standard size rim from 30 x 3 to 36 x 5, dust excluder for spare wheel, cleaning brush and special wrench, \$200. Same set with six wheels, \$225.

West—West Steel Casting Co., Cleveland—These are one-piece castings of crucible steel, and are made for trucks of three tons capacity and upwards. The

rim is of channel form, having inwardly projecting flanges in the heavier types; front wheels of the latter types are flangeless, but have stiffening ribs at the center. Heavy truck and tractor wheels are also made with double spokes and skeleton rims. The approximate cost of four cast steel wheels for a three-ton truck is \$110; these wheels would be finished and ready for tires and bearings; total weight, 900 pounds per set of four.

Ashley—General Rim Co., Cleveland, O.—Ashley wire wheels are made in three diameters, 32, 34 and 36 inches. The wheels are of the cross-wire type with two outer and two inner systems of spokes. They are equipped with Ashley-Moyer, double quick detachable rims, which are also manufactured by the General Rim Co. The company also manufactures quick detachable rims for wood wheels. A set of 32 x $3\frac{1}{2}$ wheels with a spare rim lists at \$140. A set of the 34 x 4 or 34 x $4\frac{1}{2}$ with a spare rim lists at \$155.50, and a set of the 36 x 4 or 36 x $4\frac{1}{2}$, also with a spare rim, lists at the same price. Dealers' discounts are 25 per cent and an additional 5 per cent. The General Rim Co. also manufactures felloe bands and tire tools.

Schwarz—Schwarz Wheel Co., Philadelphia, Pa.—Characterized by a double mortise or dove-tail at the inner ends of the spokes, Schwarz wheels are made in sizes from 28 x 3 to 54 x 15 for both passenger cars and motor trucks. Schwarz wheels are made to order, but the spiders are supplied without the felloe and metal rim. Spokes are made in sizes from $1\frac{1}{8}$ inches to $2\frac{1}{4}$ inches for hub flange sizes from 6 to 10 inches in diameter. Ten or twelve spokes are used to the wheel and the price of spiders ready for felloe bands ranging from \$2 to \$5.50 with discounts furnished on application.

Harris—Harris Co., East Hampton, Mass.—Wheels of all sizes are made for both pleasure and commercial service. The first grade wheels are made of New England hickory; for less expensive wheels white oak is used. Special wheels are made for Ford and Maxwell cars and are equipped with Stanweld No. 22 QD rims. Wheels are painted black; price, in oak, \$20 per set; in hickory, \$25 per set.

F. & H.—F. & H. Wire Wheel Co., Columbus, O.—Wire wheels are made from 28 x $2\frac{1}{2}$ with a carrying capacity of 250 pounds per wheel, to 36 x 6, with a carrying capacity of 1,500 pounds; they can be attached to any car, an inner hub

or adapter fitting between the old bearing and the new wheel hub. Spokes are crossed, and there are $1\frac{1}{2}$ times as many spokes on the inside row as on the outside. When the rim is offset from the center of the hub, as is usually necessary to preserve the tracking of wood wheels, on wheels with QD rims there is a deep channel under the detachable band to give stiffness. Wheels are made to take all sizes of tires and do not carry demountable rims. A slight improvement in the rim consists in the addition of a safety latch to the self-tightening nut. Prices of wheels in sets of five are as follows: 30 x $3\frac{1}{2}$, \$55; 32 x $3\frac{1}{2}$, \$60; 32 x 4, \$80; 34 x 4, \$85; 34 x $4\frac{1}{2}$, \$90; 36 x $4\frac{1}{2}$, \$100. A special set is made for Fords, the wire wheels being placed over the hubs of the wood wheels, which are detached. The wheels weigh $17\frac{1}{2}$ pounds each without tires and $22\frac{1}{4}$ pounds with straight side tires.

Lindsay—Great Western Mfg. Co., La Porte, Ind.—These are interchangeable with Ford wheels and are sold in sets of four at \$25. Four sizes are made, 28 x 3, 30 x 3, 30 x $3\frac{1}{2}$ and 32 x $3\frac{1}{2}$, all for clincher tires. Wheels are complete with brake drum, ball bearings and hub caps, and are all ready to slip on the axles. Hubs are of pressed steel. Spokes are so inserted as to be readily replaceable in case of breakage. Rims are of pressed steel. The speedometer ring, for either front wheel is supplied at \$1 extra. The set of four wheels crated weighs about 100 pounds.

Salisbury—Salisbury Wheel & Mfg. Co., Jamestown, N. Y.—The only wood used is hickory. Wheels are made from 28 x 3 to 36 x $4\frac{1}{2}$ sizes and are built to manufacturers' specifications and sold to automobile builders only.

Archibald—Archibald Wheel Co., Lawrence, Mass.—Hickory and oak are used for spokes and oak and ash for felloes in general work; in pleasure car wheels hickory is used exclusively. Spoke sizes range from $1\frac{1}{4}$ inches to 6 inches, wheels being made for cars of all sizes and types. All work is done for manufacturers to their specifications.

Mott—Mott Wheel Wks., Utica, N. Y.—Wire wheel especially for small cars. A special Ford set is furnished complete with ball bearings, dust protectors and caps, pressed steel front hubs with right hub arrangement for speedometer gear, rear hubs, complete with brake drums, dust protectors and caps. The rims are of a special light section, and are regu-

larly furnished 30 x $3\frac{1}{2}$; front wheels can be furnished 30 x 3. Finish is black enamel baked on, and the hub caps are nickel plated. Weight, approximately 92 pounds per set of four; price, \$20. Other wire wheels are made at from \$7 to \$12 per pair. Rear wheels are made for both chain and shaft drives.

Waverley—The Waverley Co., Indianapolis—Second growth hickory is used in both rims and felloes of all wheels, which are of the artillery type with large spoke flanges. All wheels are practically the same size, being designed to take 34-inch tires. No new types have been brought out.

Wayne—Wayne Wheel Co., Newark, N. J.—These wheels are made to manufacturers' specifications, all work being special. Both pleasure and commercial types are built, the woods used being hickory, oak and ash.

Eames—A. M. Eames & Co., South Framingham, Mass.—A general line of wheels is built, the woods used being hickory and oak. Special proposition is made in Ford wheels, which are furnished to dealers complete and painted with 30 x $3\frac{1}{2}$ clincher rims at \$2 each. Another proposition is to take 30 x 3 Ford wheels and make them over to 30 x $3\frac{1}{2}$, charging \$1.50 per wheel for the work. A full line of demountable rims for Ford cars is carried, prices being as low as \$15 per set of five.

Wheel & Wood Bending Co., Bridgeport, Conn.—All work is special and is done to customers' specifications. Hickory, oak, ash and birch are the woods employed.

Bimel—Bimel Spoke & Auto Wheel Co., Portland, Ind.—All types of motor car wheels are made and all sizes. Indiana and Ohio hickory are used in pleasure car wheels. In truck wheels hickory and oak spokes are used with oak and rock elm felloes. Spoke sizes range from 1 to $7\frac{3}{4}$ inches diameter, and wheels from 20 to 50 inches in diameter.

Auburn—Auburn Wheel Co., Lansing, Mich.—All work is done to customers' specifications and all wheels are made of second growth Tennessee hickory. All sizes and styles are made for both pleasure and commercial service.

Baltimore—Baltimore Hub Wheel & Mfg. Co., Baltimore, Md.—All wheels are made from Maryland second growth hickory up to and including sizes with

$3\frac{1}{2}$ -inch spokes and felloes of white oak. Spokes are of the dovetail pattern. Sizes made range from Ford wheels up to wheels of 20 tons capacity.

Ashley-Moyer—Ashley Wire Wheel & Rim Co., 1790 Broadway, New York—In addition to Ashley wire wheels this company makes the Ashley-Moyer quick-detachable demountable rim. This rim is of the two-piece pattern, the felloe band being provided with a flat face in the back and a beveled face in front. The rim has corresponding faces on its inner surface and a clincher bead. The rim is held to the wheel by a split-ring. The detachable feature consists of a rim construction which permits it to contract. It is split at one point, and the parted ends may be overlapped and drawn in by a single motion of a toggle lever. This lever is so pivoted that it is self-locking when the rim is expanded, through the pivots passing centers. The rim may be applied to either wood or wire wheels. It is standard on Ashley wire wheels, as the carrying of an extra rim obviates the necessity of having an extra wheel along. Other Ashley products are a cord type of tire, shortly to be introduced, and the Ashley wire wheel tube. This tube is intended especially for other makes of wire wheels in which the spoke nipples extend beyond the rim and are said to be injurious to the tubes. A fabric strip on the inside protects the tube.

CARBURETERS

K-D—The K-D Carburetor Co., Cleveland—This carburetor is drawn from sheet brass and all parts are interchangeable. It is of the single jet type. The air valve is a hollow brass ball placed directly below the spray nozzle and opening under the suction of the motor; it is so placed as to direct the inflowing air directly upon the atomizer in the end of the spray nozzle. This construction is permitted by the fact that the nozzle enters the mixing chamber from one side at an angle. The float is concentric, of laminated cork put together with cement that is unaffected by gasoline. All air and fuel are taken through the atomizer chamber at all speeds; the constant air is taken through four small openings around the walls, which arrangement is designed to prevent the carburetor from loading up. The atomizer carries a small charge of fuel, which is released at the first turn of the crank, providing a good mixture for starting. A dirt and water trap is built into the carburetor to eliminate extra attachments. The carburetor

is made especially for Maxwell cars, but other sizes will be built.

Air-Friction—The Air-Friction Carburetor Co., Dayton, O.—The leading characteristic is that instead of the usual type of spray nozzle there is an annular opening through which the fuel is drawn, the fuel being distributed through four small openings into a narrow space between two flat rings which are spaced .015 inch apart. There is but one air opening, all the air passing the annular fuel opening at right angles and coming directly in contact with the fuel. An improvement consists in the use of a new type of spray nozzle which does not require adjustment. The carburetor is fitted with a nozzle of the proper size, and the gasoline needs no further regulating. An adjusting screw controls the air valve. A hot air attachment with dash control is fitted at a slight extra cost.

Rayfield—Findeisen & Kropf Mfg. Co., Chicago—For the present year the Findeisen & Kropf Co., Chicago, will exploit its Model G Rayfield carburetor as its principal model. This is an improved type in which the air valve adjustment has been eliminated, both high- and low-speed adjustments being through the fuel. This model supersedes Model C, which is of the dashpot type and which was illustrated in the Before-New York Show issue as being one of the latest types.

CHAINS

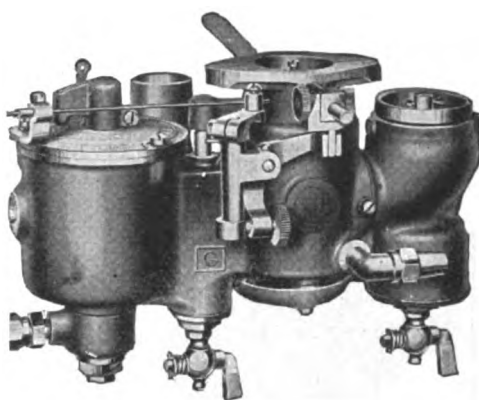
Link-Belt—Link-Belt Co., Chicago—Silent chains are manufactured in two types, one of which is designed for high and the other for low speed where absence of noise is a necessity. Chains are made in two styles, one having a flange or guide link, and the other requiring flanges or shrouds on the sprockets. Roller chains are also made for heavy duty at moderate speeds where silence is not essential. No changes have been made with the exception of minor improvements in manufacturing details, chief of which is a pre-stretching system which largely eliminates initial elongation.

Coventry—Herbert L. Funke Co., Inc., New York—A new type of roller chain has been brought out. It is a detachable chain and is peculiar in that a single long cotter pin passes through both rivets of each link. This arrangement is designed to prevent the weakening of the pin by vibration and shocks. Silent type chains

also are manufactured and have been improved by grinding the link faces and by the use of a new type of outside guide plates which equalize elasticity throughout the links of the chain. Both roller and silent chains are made in all standard sizes.

BUMPERS

Grossman—Emil Grossman Mfg. Co., Brooklyn—The latest bumper for Ford cars is designed to provide substantial attachment and also to improve the appearance of the car. The bumper arms



In the latest Rayfield carburetor, Model G, the air adjustment has been eliminated

are shaped like the front ends of frames and are attached just under the radiator. The extensions are of the telescoping spring type. The price with black finish is \$4.85; brass and nickel, \$6.25. These frame-line bumpers, as they are called, are made also in models for larger cars at \$6.25 and \$7.25. In error the two bumpers marked No. 1 and 2 on page 67 of the Before-New York Show issue were designated Gemco whereas they are Grossmans.

C-C—Cox Brass Mfg. Co., Albany, N. Y.—A new model is the E-Z clamp-on bumper, which is made with round channel. The attaching bracket may be attached to any part of the frame front end, a notched wedge permitting the arms to be set at any desired angle. The plunger rod, which acts on the coil spring, is carried on long bearings to avoid the possibility of rattle. Price, diamond, all black, \$7; nickel-plated rail and trimmings, \$9. Round rail, black, \$5; brass rail and trimmings, \$6.50; nickel-plated rail and trimmings, \$8. Channel type, \$7 and \$9. Ford bumper with brackets to attach at radiator sides, \$5 in black enamel.

Sager—J. H. Sager Co., Rochester, N. Y.—Two new models have been

added to this line of bumpers, both of which feature a new method of fastening the bar to the arms. The bar is of modified channel form, the flanges being turned inward so that they are at an acute angle with the web or wide face. At the end of each arm is a pad of the same shape as the space between the flanges of the car and carrying two set-screws pointing forward. When these are screwed up, the pad is forced backward against the flanges and held tightly without the use of rivets and without the necessity for drilling holes or otherwise weakening the bar. The two models differ in that one is adjustable to any frame, while the other is made with attachments to fit a number of standard cars and is called the Simplex. The Simplex is made in black, brass and nickel; prices, black, \$10; brass or nickel, \$12. The prices and finishes of the Universal model are the same.

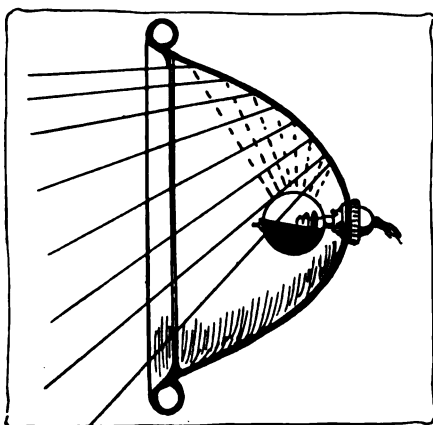
DIMMERS

Hick-Meyer — Hickmeyer Deflector Co., Toledo, O.—This is a device for deflecting the rays of a light straight out and down on the road, the beam of light being not over 4 feet above the road. This device snaps around the under side of the bulb, thus deflecting the light rays to the roof of the lamp and then down on the road. The price is \$2 per set.

H-M—H. M. Mulchaney, 8 Mt. Vernon street, Providence, R. I.—This is a ray controller, which shades the light but does not dim it. The upper inside of the glass is frosted to a point a little below its center, diffusing the powerful glaring rays from the upper part of the reflector and allowing a strong beam to be thrown upon the roadway from the lower part. It retains the sidelight and allows the full diameter of the lamp to be illuminated at night. It is made in either flat or curved glass.

Eclipse—Vesta Accumulator Co., 2100 Indiana Ave., Chicago—This is a disk of special glass which replaces the glass in the headlight. In the center of the glass is a screw which holds a metal disk which shuts off the glare and permits only a diffused light to pass. For lamps up to 10 inches in diameter, \$1.25, 10 to 12 inches, \$1.50; dealers, 25 per cent.

J-M—H. W. Johns-Manville Co., New York—This device consists of a special lens made of curved glass with the inner surface frosted all except the central



The Hick-Myer deflector prevents the upward projection of light from the reflector

transparent portion. The lens throws a bright gleam of light a long distance ahead and slightly downward, while the frosted part throws out a diffused light. Five standard sizes are made, 8, 8½, 9, 9½ and 10 inches. Price, \$5 per pair, any size. The lenses will fit almost any standard lamp.

Hampton—The Hampton Glareless Lamp Co., New York City—Three types of electric glareless lamps, ranging from \$20 to \$40 a pair, are made. Each lamp is furnished with a special 6-volt 50-candlepower Mazda lamp or 15-, 18- or 24-candlepower. The rays from the bulb are cast ahead in parallel lines by means of a cylindrical ray concentrator placed just in front of the bulb. This ray concentrator has three fixed points of suspension, is cylindrical in form with slightly narrowed center. The upper half of the interior surface is highly finished and reflects the imprisoned light rays directly on the roadway. The lower half of the interior surface is heavily darkened and absorbs all those rays which, were it a polished surface, would be reflected up to the eye level.

Safety First—Eclipse Mfg. Co., Auburn, N. Y.—This consists of a pair of roller shades which, when a foot button is pressed, are pulled down over the headlights, permitting only a diffused light to pass. Continued unchanged. Price, \$10.

Dimit—Suburban Lighting & Gas Engine Co., Toledo—A circular case carries a switch lever with four contact points for varying the intensity of the light. Two models are made which differ only in detail, one being adapted for Fords; either model is \$2.50.

Dim-A-Light—Pellet's Magneto Exchange, 1606 Michigan avenue, Chicago

—This is a resistance element enclosed in a small rectangular casing which may be mounted on the dash under the hood with the switch in reach of the driver. The headlights are reduced to 25 per cent of their full brightness. No changes have been made. Price, \$3.50; dealers, 40 per cent.

UNIVERSAL JOINTS

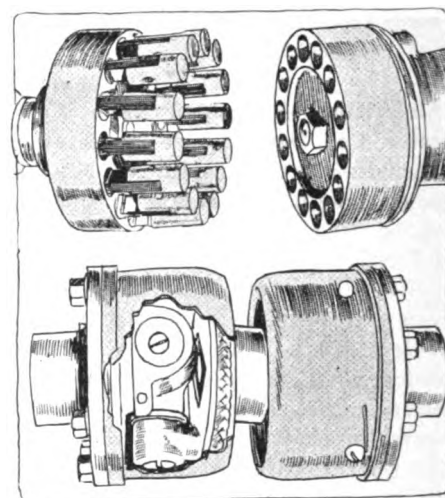
Blood—Blood Bros. Machine Co., Kalamazoo, Mich.—Both single and double joints are manufactured. Style A is a single joint made for all sizes of shafts up to 3 inches and has a square center block carrying the pins. It can be taken apart and put together without tools. The ends of the pins are protected by grease caps. Style M is fully enclosed and is constructed on the same lines as style A, though the grease caps are



Blood Bros. single and double universal joints with and without dustproof housing

made unnecessary by the casing. The open end of the case is closed by a heavy leather disk held in place by a steel ring at the edge and a threaded sleeve at the hub. This joint is made for shafts from 1 to 1¾ inches. Style D is a double joint, consisting of a short shaft at one end of which is a joint with a flange and at the other end a joint with the hub bored for square, taper or straight shafts. A leather disk joint is made for light service.

Baker—Baker Gun & Forging Co., Batavia, N. Y.—These universal joints are of the yoke-and-ring type, the ring being made in two parts. Trunnions are forged solid with the yoke and are not hardened, the wear being taken by hardened sleeves pressed on; when worn, sleeves may be forced off and new ones put on. The casing which encloses the joint has no sliding parts, the flexible



Lower—Acme enclosed double universal. Upper—Smith flexible pin coupling

part being of leather in one piece and so treated as to be grease-proof. Three sizes are made, transmitting 25, 50 and 65 horsepower.

Konigslow—Otto Konigslow Mfg. Co., Cleveland—Only one size is manufactured, this being suitable for cars under 30 horsepower and taking shafts 1½ inch square or round shafts 1¼ inch in diameter. The joint is of the cross-and-pin type; the steel pins have conical inner ends where they come together in the center of the cross and are held in place by keys. All the parts are enclosed in a metal casing with oil tight packing.

B-T-K—B-T-K Gear & Engine Co., Muncie, Ind.—A single model is manufactured for use in connection with cone clutches. It is made only in one size but is fitted with flanges of different dimensions and is fully enclosed with metal casings and a leather boot. It is capable of transmitting as high as 50 or 60 horsepower. Price, \$6.50. The standard joint has a 4¾-inch flange with six ¾ bolt holes drilled on a 4-inch circle, and at the opposite end is bored for a 1½-inch shaft and has a plain keyway. Flange dimensions and drilling can be changed, however, to suit specifications.

Francke—Smith-Serrell Co., New York—These couplings are of the pin type and consist of two flanges, one on the driving and one on the driven shaft connected by flexible pins, each pin made up of a sheaf of thin steel leaves, the ends of which are secured in slotted heads, which enter holes in the two flanges. They are designed to compensate for slight errors of alignment and are made in all sizes. The prices range from \$16 for the ¾-inch size, to \$21 for the 1¾-inch in cast iron, and from \$18.40 to \$24.15

in steel. Larger sizes are made at proportionate prices.

Standard — Universal Machine Co., Bowling Green, O.—Joints are made in all sizes up to 60 horsepower capacity and all embody the same main features. A combination of ball-and-socket and roller bearings is employed, the ball and socket taking care of the vertical motion and the end thrust, and the roller bearings on the pins taking the driving torque. Wearing surfaces are hardened and ground. A new model has been brought out in which there are two roller bearings instead of four, and the construction is less expensive. All models are completely enclosed with metal and leather. Price of the four-roller joint is \$12 and of the new light-service joint \$4.

Acme—Acme Universal Joint Co., Kalamazoo, Mich.—These joints are made in single models for shafts from $\frac{3}{4}$ to $1\frac{1}{4}$ inches and double from 1 to $1\frac{1}{4}$ inches. All joints are of the same construction, having forged steel flanged hubs, hardened and ground bearings, sleeves and center blocks of the same steel as the hubs, and cross pins of tool steel. Casings are made in two parts of drawn steel with oil tight packing between. Single joints vary in price from \$6.50 for $\frac{3}{4}$ -inch size to \$13 for $1\frac{1}{4}$ -inch, and double joints from \$11 for 1-inch to \$16 for $1\frac{1}{4}$ -inch.

Spicer—Spicer Mfg. Co., Plainfield, N. J.—All sizes and capacities are built but all are alike in design, the central member being an octagon with hollow center and four hardened steel pins integrally formed to carry the yokes. The joints have been changed only in minor details, but the Spicer propeller shaft is now made tubular instead of solid, which reduces weight and increases stiffness. All styles of shaft connections are provided and all joints are housed in steel casings with oil tight packing. Casing adjustments are provided so that if the casing is loosened by wear it can be tightened. A special joint for use between motor and gearset is provided with a slip joint. Among the manufacturing improvements is included a new type of welding apparatus.

LIGHTING SYSTEMS

Esterline—Esterline Co., Indianapolis, Ind.—A generator especially for Fords has been brought out. It has permanent magnets and is driven by belt, which also

runs the fan. The feature of the machine is the use of the permanent magnets in connection with an electro-magnetic field, the result being a greatly increased output, it is said. All the necessary attachments are furnished with the generator and it is stated that the machine can be applied in three hours and that it is not necessary to remove the radiator or other parts of the car to do it. The regulation of the current is inherent. An automatic cut-out is provided for disconnecting the battery when the speed of the generator drops so low that the battery would discharge through the armature windings. The cut-out is mounted directly on the generator, thus reducing the wiring to a minimum. The balance of the equipment comprises the lighting switch, storage battery, lamps, and the necessary cables, the latter being marked so that no mistake can be made. Golden Glow glass reflectors are included in the equipment. These are mounted in the regular Ford lamps. The machine has an output of 10 amperes and weighs 24 pounds. It sells for \$30; with battery, \$40.

Jackson—Chas. A. Jackson Co., Boston, Mass.—A Ford lighting system which sells complete for \$31 has been brought out. It is mounted at the right of the engine on a suitable bracket and is driven from a broad, flat belt, which also drives the fan. To accommodate this belt a special pulley replaces the ordinary fan pulley on the crankshaft. A feature of the drive is the use of spurs on the small generator pulley which project into holes in the belt, thus giving the effect of a chain drive. Since the driving pulley is much larger, spurs are not required on it. Voltage regulation is by means of a governor, which keeps the armature at a constant speed regardless of the speed of the engine. A cut-out is provided to prevent the battery discharging through the generator at low motor speeds. The normal speed is 1,800, weight 9.5 pounds, and the output is 8 amperes at 7 volts. The length is 8 inches and the extreme height 5 inches.

RIMS

Stanweld — Standard Welding Co., Cleveland, O.—Departing from anything previous, a new Stanweld rim has been developed. Its chief points of difference are that the side flanges once applied to a casing remain with it permanently as long as it is used, not being removed in changing tires, that they are not split and that the felloe band has but one

bevelled face, that to the rear. The rim is simpler than previous types.

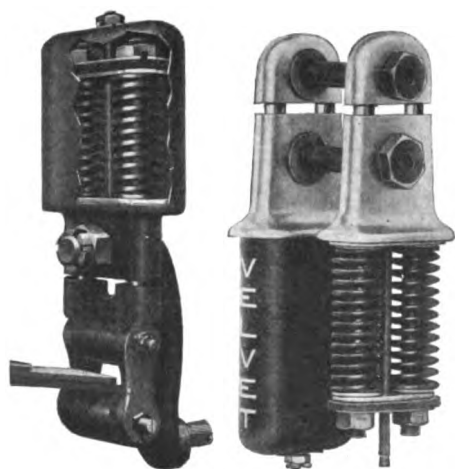
It consists of a single felloe band permanently shrunk on to the wheel, the rim, which is bevelled on both inside edges, and split, two continuous side flanges, which may be of the clincher or straight-side type, and the split wedging, bevelled on the outside only.

The side flanges are attached to the casing independently. The rim, whose ends are overlapped and contracted by means of a toggle-lever, is expanded over locking ridges on the side flanges, and the tire is locked to the rim. In application, the tire is pushed onto the wheel against the back bevel and the locking ring inserted, the latter being retained by six locking nuts. In repairing a tube, it is only necessary to remove the rim from the wheel, move the toggle-lever to contract the rim, and slip the rim out. The inside of the casing is thus exposed and the tube may be removed or inserted without interfering with the side flanges. There is no pushing of the tire over the rim, so that pinching danger is minimized.

The rim is made in 4-inch widths for 32-, 34- and 36-inch wheels, this size costing \$32.70 complete; in 34- and 36-inch sizes for $4\frac{1}{2}$ -inch widths at \$36.90, and in 34- and 36-inch sizes for 5-inch widths at \$36.90.

Presto—Presto Inter-Rim Co., Boston—These rims are manufactured in all sizes and a special outfit is built for Ford cars. A locking rim of the slit type is made and is removed by a single movement of a lever. The Ford set includes four wheels with rims applied, one extra rim, 24 hub flange nuts and bolts; price, \$25; dealers, 1 to 10 sets, \$18; 10 to 50 sets, \$16.50; 50 sets and upward, \$15. The larger rims are made in both straight side and QD clincher but are not universal.

Ashley-Moyer — General Rim Co., Cleveland—Demountable rims are manufactured for use on both wood and wire wheels. Rims for wood wheels have no bolts passing through the felloe, the rim being attached to the wheel band by means of an expanding rim in a groove in the felloe band; a toggle expanding device operates in the ring. Rims are made for either clincher or straight side tires; either type can be used on the same felloe band. The clincher is the S. A. E. standard clincher rim and the straight side is the new Goodyear standard width. They are single piece, transversely cut and held by locking clips. Prices, 30 x $3\frac{1}{2}$ or 32 x $3\frac{1}{2}$, \$30.20 per



Velvet shock absorbers. Left, new Ford model; right, regular type, \$35. Both have multiple springs

set; 34 x 4 and 36 x 4. \$30.80; 34 x 4½ and 36 x 4½, \$37.50. Complete set comprises five tire rims, four felloe bands, one rim tool and one ratchet wrench. Dealers, 25 to 40 per cent.

Stanweld — Standard Welding Co., Cleveland—Stanweld wire wheels for Ford cars may be attached without any change in the wheel bearings. They are made with plain clincher rims or with the Stanweld quickly detachable rims at a slightly higher cost. The rim part of the wheel is made of steel. The spokes are reinforced at both ends, where the breaking tendency is greatest. The three-crossed method of lacing is used, there being 48 spokes in each wheel. The hub is a steel stamping. A set of four wheels having the plain clincher rims costs \$25 and a set with quick detachable rims \$32.50.

SHOCK ABSORBERS

Velvet—John W. Blackledge Mfg. Co., Chicago—A new model has been brought out, designed especially for Ford cars, and includes all the features of the larger absorbers, including two pairs of springs and sliding blocks with long bearing surfaces. The multiple spring principle is designed to absorb as much as possible of the vibration that the leaf springs fail to take up. The price of the Ford set is \$15. Each absorber consists of two pairs of coil springs, each pair enclosed in a steel casing; they are mounted at opposite ends of the leaf spring eye-bolts so that all strains are equally divided between the two pairs. The two springs of each pair have two rods of hardened steel sliding through long blocks of hard bronze. The cross-bolts, which pass through the spring eyes and

are connected, one to the head of the sliding rods, and the other to the block through which they travel, are bushed with hardened steel. The casing covers, which are bolted on and are easily removable, are arranged to contain a supply of grease for lubrication. The regular models of Velvet shock absorbers are suitable for all cars having three-quarter elliptic scroll end or platform springs in the rear and for most other cars, provided they do not have a rear crossbar. The installation is readily made by any garage or repairman. Price, \$35 per set.

Mesinger—H. & F. Mesinger Mfg. Co., New York—This is a rebound check spring device; two coil springs are clipped to the frame of the car above the axle, and a strap passes under the axle with its ends connected to the two springs. Price, cars up to 1,200 pounds, \$4.50 per pair; up to 1,800 pounds, \$6.75; above 1,800 pounds, \$9. Extra heavy 7-passenger cars, \$12. A single-spring type for cars having at least 9 inches clear space between frame and axle is made in four sizes; No. 1, for front only, \$3 per pair; No. 2, light cars, \$4.50; No. 3, medium cars, \$6; No. 4, heavy cars, \$7.50. Single-spring type for Ford rear axle, \$4.50 per pair.

O-M-C—A. J. Picard & Co., New York—This Ford shock absorber is of the coil spring type but utilizes two sets of springs, one of which is compounded. The cylinder or casing is centrally divided; in the lower chamber there is a single coil spring of round steel and in the upper chamber an inner spring of round steel and an outer spring of square stock. Instead of a plunger at the top of the spring, there is a cap which telescopes over the cylinder. The upper springs are designed to take the ordinary vibration, while the lower spring checks rebounds. The price is \$8 per pair and \$15 per set of four.

Universal — Universal Shock Eliminator, Inc., New York—A new model has been brought out in which the coil spring which is unusually long and large is enclosed in a vertical casing designed to be mounted at the front end of the leaf spring. The device has a peculiar action due to the fact that the amplitude of spring motion is increased by a lever which forms the connection with the lower leaf spring, so that it is doubled when it reaches the coil spring—that is, the movement of ¼ inch of the leaf spring produces a movement of ½ inch of the coil spring. Another feature of the device is that a lever connected with

the shock absorbing spring extends forward and has an eye in its end; the two eyes form supports for a bumper bar and shocks are cushioned by the shock absorbing springs. The new model is designed for full elliptic or three-quarter elliptic springs. For semi-elliptic springs the older type is used, which, while working on the same principle, has its cylinder under and practically parallel with the spring. For cars under 2,000 pounds the front spring type, including bumper, costs \$40; rear set for platform or three-quarter elliptic springs, \$30. For cars over 2,000 pounds, \$60 and \$40.

Halladay—L. P. Halladay Co., Streator, Ill.—This type of coil spring shock absorber for Ford cars is made without sliding parts, the spring working freely in its casing under the pull of a central rod which has considerable lateral freedom. The construction has been improved by the adoption of a tapering spring of flat steel, the small end being at the top. The device is set at an angle to eliminate side thrust due to the swaying of the body and the alternate lengthening and shortening of the springs. The price is \$12 per set of four.

J-M—J-M Shock Absorber Co., Philadelphia—The J-M Shock Absorber Co. has not departed from the standard principles of construction used in its shock absorbers, but details have been much changed. Two springs are used in parallel casings. Vibrations are transmitted to the coil spring by two U-shaped bolts, the loops of which rest on a pin or bolt in the lower leaf spring eye, while the ends pass through plungers or disks at the opposite ends of the springs. These U-bolts slide in long guides projecting from the tops of the cases. The cases in former models were of steel tubing, the covers carrying the guides were of bronze, the guides were of bronze and the plungers under the springs leather-packed steel stampings. In the new models each cylinder together with its cover and guide housings is pressed out of one piece of steel; the guides are of hard gray fiber inserted in the housing, and the plungers are of the same material.

One result of these changes is that the weight has been reduced eight pounds per set, while the balance is better, there being considerably less overhanging weight. The fiber bushings wear at least as well as the bronze and when worn out can be easily removed and replaced.

The Ford shock absorber is a new model and is of the single spring construction and has the same pressed steel

casing and the same flat steel coil spring as the larger model. The casing is rigidly supported by the spring lug on the axle to prevent side sway. Only steel forgings are used for the parts subjected to heavy strains.

The price of the twin spring type of shock absorber is now \$30 per set of four instead of \$35. The price of the Ford type is \$25 per set of four, or \$15 for the rear wheel pair.

Flexo—Fowler Lamp & Mfg. Co., Chicago—This is of the auxiliary spring type and consists of a set of double looped springs connected between the ends of the main cross springs and the spring lugs on the axles. Price, \$8 per set, ready for installation; dealers, 25 per cent.

New Era—New Era Spring & Specialty Co., Detroit—These springs are of the enclosed coil type, with double spirals to take both light and heavy vibrations. The parts are made from steel forgings and the bearing where the greatest wear comes is a brass bushing. The plunger bearing is $2\frac{3}{4}$ inches long. The springs automatically adjust themselves to the weight of the load. Price, per set of four, \$10; per pair, \$6. A less expensively constructed model is made at \$5 per set of four.

Nyco—New York Coil Co., Inc., New York—These are made especially for Ford cars and are designed to replace the regular spring shackles. The device consists of three pieces, a steel housing, a spring to carry the weight of the car and a sliding member which rests on top of the spring perch and is free to move up and down, there being slots in the two outside arms. The shock absorber has two motions, vertical and lateral, the latter movement compensating for the lengthening and shortening of the spring. Price, \$7 per set of four.

B & R—B & R Shock Absorber Co., Philadelphia—This is a flat coil spring shock absorber for Ford cars. The spring has half a dozen convolutions, like a clock spring; its center is attached to a vertical bracket and the free end to a lug, these taking the place of the regular Ford fixtures. The price is \$15 per pair; dealers and garagemen, 20 and 25 per cent.

Johnson—Triple Action Spring Co., Chicago—New models have been developed, one for electric cars and one for trucks. In both cases the new feature is the addition of a third coil spring to the

two already used, so that there are three nested springs of graduated strength capable of taking all vibration from the lightest to the heaviest. The steel casings are dust- and waterproof. The Vesta Storage Battery Co., New York, is eastern distributor for these shock absorbers.

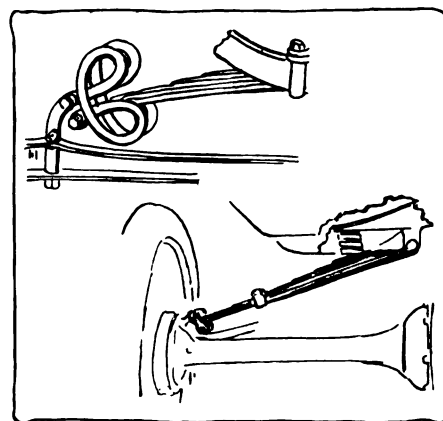
CUT-OUTS

Barco—Barco Brass & Joint Co., 212-222 West Illinois street, Chicago—The T-shaped casting which forms this cut-out is made in two parts, permitting easy attachment to any exhaust pipe. The butterfly valve is operated by an outside lever; a V-shaped piece is sawed out of the exhaust pipe to discharge the gas. Four sizes are made for iron pipe and steel tubing from 1 to $3\frac{1}{2}$ inches. Prices, including boring, \$2, \$2.50, \$3 and \$4; if not bored the prices are 25 per cent less for the two smaller sizes and 50 per cent less for the two larger. A special Ford cutout outfit is furnished with pedal and connections complete. The price with plain lever pedal, \$1.80; with plunger type pedal, \$2.

Empire & Essex—S. B. R. Specialty Co., East Orange, N. J.—The Empire cut-out is of malleable iron with strap type clamps and right angle discharge pipe containing a butterfly valve. It is made in five sizes, 1-inch, \$1; $1\frac{1}{4}$ -, \$1.15; $1\frac{1}{2}$ -, \$1.30; 2-, \$1.45; $2\frac{1}{2}$ -, \$1.60. The Essex cut-out has a valve of the poppet type and requires careful fitting to the exhaust pipe. It is made in the same sizes as the Empire and the prices are \$1.60, \$1.75, \$2, \$2.25 and \$2.50.

RECTIFIERS

Beacon—Electric Economy Co., Hyde Park, Mass.—Three rectifying sets are made, all of the electrolytic type. Set No. 1711 includes switchboard with switch, fuses and binding posts, set of heavy stranded cables and four rectifying units in form of open metal tanks, $46 \times 19\frac{1}{2}$ inches and 8 inches deep, which may be placed on the floor or on brackets, one above the other. Capacity, 36 amperes on 26 cells or less; slightly lower rate on larger number of cells. Price, \$130. Set No. 1712 is the same but has only two rectifying units and the capacity is about one-half that of No. 1711. Price, \$80. Set No. 1713 has two rectifying units $15 \times 19\frac{1}{2}$ and 8 inches deep, and one $30 \times 19\frac{1}{2}$ and 8 inches deep. The capacity is 8 to 10 amperes on any battery up to 40 cells.



Two Ford shock absorbers. Upper—Fowler double loop. Lower—Garden City, which reduces period of vibration

Price, \$60. All sets are designed for approximately 110 volts, 60 cycles. Sets are supplied on a rental basis when desired, the monthly rate being 20 per cent of the purchase price and applying if desired on purchase payment. If apparatus is not purchased, return freight is paid up to 1,000 miles. Renewals needed from time to time cost about $\frac{1}{4}$ cent per ampere-hour of service, or about 5 cents per hour on 20-ampere current. Dealers, 30 per cent.

Red Devil—J. F. Ashbrook, Chicago—This is one of the electrolytic type and is designed to operate on any alternating current of 110 to 125 volts and to charge 6-volt storage batteries such as are used for lighting and starting. The maximum capacity in amperes is 9, and the minimum 5. The apparatus is enclosed in a casing and is self-contained. When starting a charge it is necessary only to connect the terminals and close the switch. In case of an interruption in the alternating current, the battery cannot discharge through the rectifier, and charging will be resumed when the alternating supply continues. Price, \$25.

WRENCHES

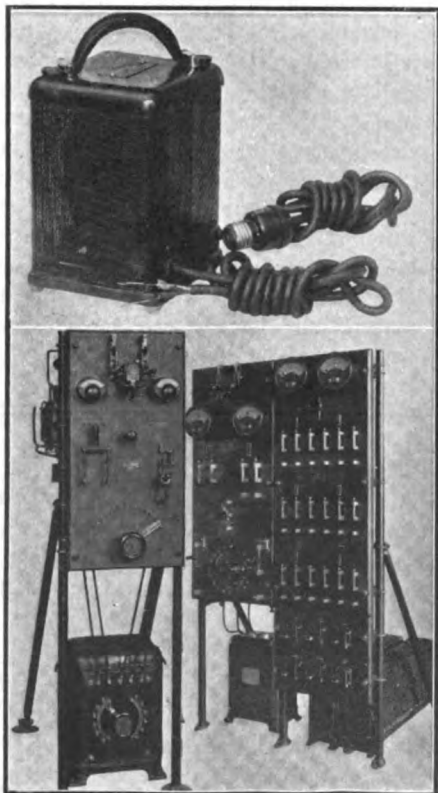
Unique—Will B. Lane, 180 North Dearborn street, Chicago—Two sets of socket wrenches are made, both consisting of ratchet handle, two screwdriver blades and seven sockets. One set is made to fit standard semi-finished hexagon nuts $\frac{1}{2}$ to $\frac{3}{8}$ inch, in heavy leather case, \$2.50; the other set is for Ford cars and in heavy leather case costs \$3.

Harris & Reed Mfg. Co., Chicago—Flat wrenches of special steel, tempered hard. Double and single end, alligator and special wrenches; the Handy set consists of nine wrenches in one; wrench sets in boxes, \$18.36 to \$63.50 per dozen

sets; in cloth rolls, \$21.36 to \$67 per dozen sets, less 50 per cent; dealers, from 50 and 30 per cent to 50, 30 and 20 per cent, according to quantity.

Brake Lining Countersinks—Stevens & Co., New York—A special tool for drilling and countersinking brake lining for rivets has been brought out. It consists of a special fluted pin drill formed integral with the countersink, the latter having either tapered or flat form. They are made in three sizes, $\frac{3}{8}$, $\frac{1}{2}$ and 9 16 inch, and all have $\frac{1}{4}$ -inch shanks, so that they can be used in either hand or power drills. The price for any size is 40 cents each.

Safety First—Frank Mossberg Co., Attleboro, Mass.—This is a socket wrench set for Ford cars and consists of a ratchet socket handle with spring lock for sockets, universal joint, extension tube, screwdriver bit and 10 pressed steel sockets, one of which is for spark plugs. These wrenches fit all the nuts and bolts on the Ford car. The outfit is packed in a leather-board case; \$4.50. A full line is also manufactured of cylinder-head nut wrenches, hub cap wrenches, thin model engineers' wrenches, socket wrenches and housing wrenches, and other types.



General Electric battery charging rectifiers. Upper—Mechanical type for charging 3-cell battery; capacity, 5 to 6 amperes, 7 1/2 volts. Lower—Mercury arc type for heavier currents; left, single panel suitable for private garage service; right, panel and switchboard to which units can be added

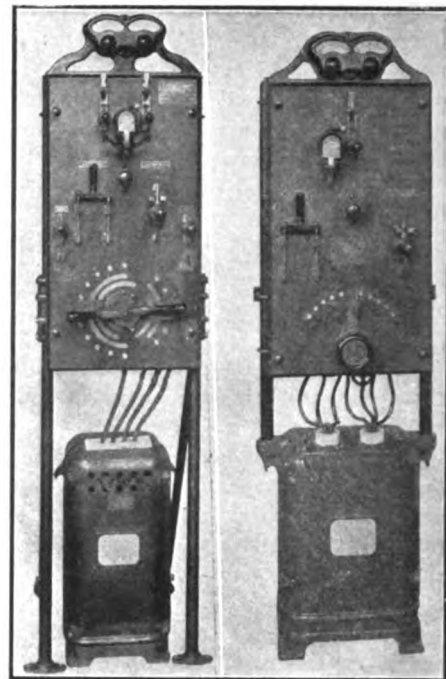
TRUNKS

Ajax—Ajax Trunk & Sample Case Co., New York city—A complete line of trunks, luggage carriers, racks, straps, covers, etc., is made. Two articles in particular are of interest, one being the Restaurant tire trunk, containing a complete luncheon set for six persons, with two quart and two pint Thermos bottles, folding legs inside the cover permitting the latter to be used as a table. With notch for tire nipples, \$74. Without the Thermos bottles the outfit sells for \$64. Luncheon kits for two, four, six and eight persons may be had up to \$62. The other article is the All-Wood tire trunk, which is made of three-ply basswood veneer with revolving door operating inside a wide flange with curved ends underneath which is a similar flange covered with felt, making a water and dust-proof joint. The trunk is covered with imported leather and is linen-lined with brass lock and trimmings, selling at \$16.50 for sizes from 20 to 26 inches in diameter and 9 inches deep. With arch for demountable rims, \$18. For trunk over this size additional cost is \$2 per additional inch of diameter.

There are three coat rail bags of different style, one with provision for extending the cover to carry hats, blankets, etc. These sell at prices from \$6 to \$18, the materials used being duck and leather. An adjustable folding baggage rack lists at \$4 for the $\frac{7}{8}$ x 3/16-inch flat steel and \$5 for the 1 x $\frac{1}{4}$ -inch steel. The Ajax company makes a specialty of special trunks designed for all makes of cars, the idea being that each fits into the lines of its respective car and at the same time is easy to open and of maximum carrying capacity without being bulky.

Hat boxes are listed at \$6.25 to \$17.50, with a special hat trunk at \$22 to \$26, according to size. Interlock tire covers are so arranged that edges interlock. They are made in extra heavy enameled duck at \$3.25, including inner tube bag. Other than standard colors are 75 cents extra and demountable rim styles cost 60 cents more than the other variety.

Berg—Berg Auto Trunk & Specialty Co., New York—Company makes a most comprehensive line of luggage carriers of all kinds for automobile use. One of the features which is attracting attention is the new Robe Rail Restaurant, a neat luncheon kit for six people, complete in every detail except for the vacuum bottles, the table folding into the same



G. E. Mercury arc rectifiers. Right, single phase, with panel board. Left—Combination series A. C. and main reactance in one case. Both have full meter and control equipment

case with the kit, a case 20 x 24 inches, 6 inches wide at the bottom and 4 inches at the top. It may be opened and set up in the tonneau, eliminating the necessity for leaving the car in bad weather, or it may be used in the ordinary roadside manner. It sells at \$30. Luncheon sets for four and six people sell at \$20 and \$25, respectively, including everything except the vacuum bottles. There is a very compact little tea set for four persons, including alcohol lamp, which uses solid alcohol, and two food boxes and nickel serving tray.

A patented idea in the Berg luncheon sets is a device for holding bottles, a coil spring at the bottom taking up all vibration while a socket at the top prevents the bottle from slipping out of place or striking against the sides of the case.

The Submarine tire trunk is a leading feature of the Berg line, the makers guaranteeing it to be absolutely water and dust-proof, being made of veneer basswood, leather-bound, and cemented with a steel door which closes with a quarter-turn bayonet lock on a rubber cushion. A padlock prevents theft. It lists at \$16.50 with cutout for tire nipple and at \$15 without this feature. A new article of the company is the new style Utility rail bag. This is made like a traveling bag except that it is flat and flexible with provision for attaching to the robe rail in the tonneau, while a handle is fitted to allow carrying the bag into a store for shopping or similar

use. Snaps and locks like those on a suit case are employed. It sells at \$7.

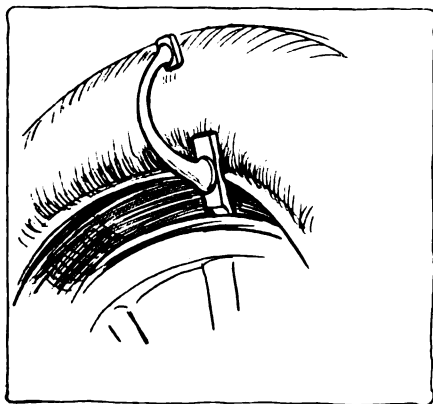
Nesco—National Enameling & Stamping Co., Philadelphia—This is a tire trunk of circular shape made of sheet steel with corrugated bottom and designed to be strapped to the car. It can be used for carrying either tires or luggage or both, there being a central space which the tires do not occupy. Price, \$3.50.

TIRE TOOLS

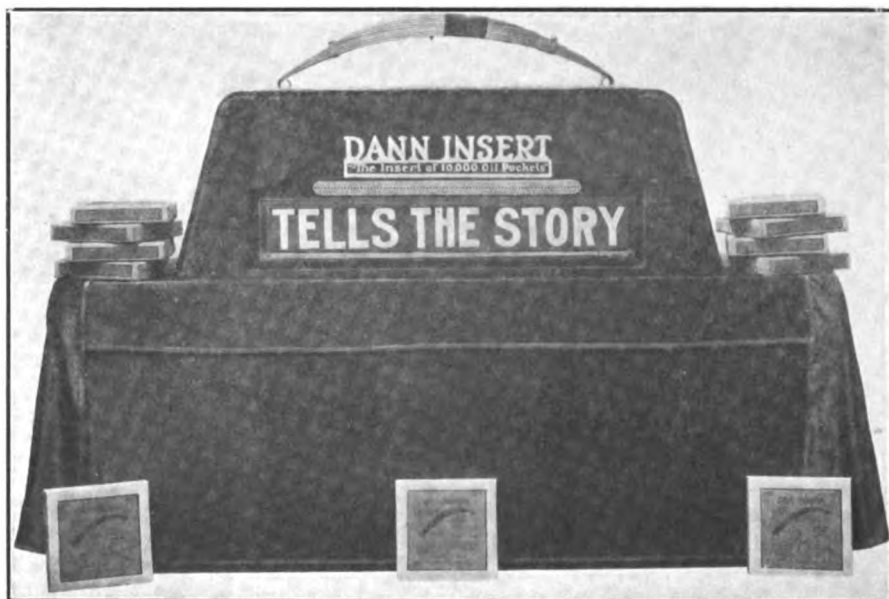
Hoover—W. H. Hoover Co., New Berlin, O.—The lever-and-plunger mechanism of this tire tool operates through a ratchet and can be set to fit any tire. Once the adjustment has been made the tool can be applied without further manipulation. The length of the lever stroke is such that when the inner rim has been pushed clear the lever is at the end of its movement. The handle is removable and is so shaped that it can be used as a hand tire tool. Number 1 for 3 to 4-inch rim, \$1.25; number 2, 4½ to 6-inch rim, \$1.25; dealers, 30 per cent; jobbers up to 50 per cent, according to quantity.

Clincher Tire Plow Co. of New York—This tool is designed for the removal and replacement of clincher tires and has a long shank, the end of which is placed on the ground, while a projecting curved plow-like member is inserted under the head; the wheel is then turned by hand and the tire is plowed off. The process is reversed for replacing a tire. The device consists of two parts, of malleable iron.

L. & M.—Adam A. Long Mch. Wks., Rochester, N. Y.—In this tool the plunger is of the rack type and is operated by a pinion and lever, the latter sufficiently long to give ample leverage.



Handy tool to simplify tire removal, made by the Michigan Motor Specialties Co.



The Dann Oil Cushion Spring Insert Co. had a mechanical lecturer at the New York show. The large letters in the center are on an illuminated belt sign which tells the story as it goes around and around. The device will be used at the Chicago show

The yoke is made of sufficient capacity to span any rim and the length of the plunger is sufficient to enable it to handle any tire. The pad on the end of the plunger prevents injury to the shoe and gives a firm grip. By tilting the yoke a tire may be pushed completely off the rim. Two sizes are made, at \$2 and \$2.50 respectively; dealers, \$1.20 and \$1.25. A special tool is made for removing and replacing Q. D. rings. Jaws for gripping the ring are operated by handles after the manner of pliers. Price, \$1.50; dealers, \$1.05.

Nelson—A. Nelson Mfg. Co., Chicago—This is a tire lever which differs from other tools of its class in that it is drop forged from spring steel, and though very light and thin, is amply strong. The length of the lever is 12 inches, the width 1¼ inches, and the thickness 3/16 inch.

Calnan—Calnan Tire Remover Co., Boston—This tool is of the yoke and screw type and is essentially a screw clamp with pads designed to fit the tire and rim; the screw is operated by a crank handle. The stationary pad is adjustable by means of a short screw. A tire iron goes with each tool. Price, nickel finish, \$2.25.

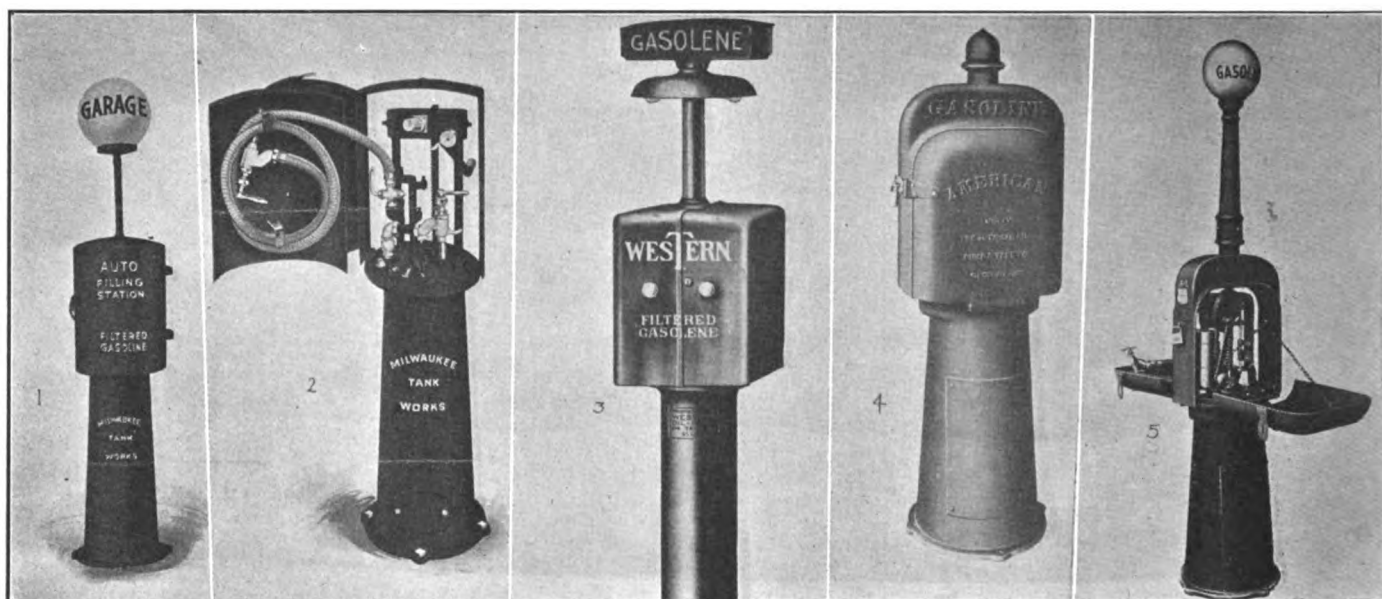
Star—Charles G. Carlson & Co., 3713-3733 Wall street, Chicago—The leverage of this tool is such that one pound pressure on the handle produces 10 pounds pressure on the tire rim. A sliding adjustment opposite the lever end of the yoke is provided. The handle folds on the yoke when the tool is not in use. Price, \$2.50.

E. Z.—Eastman & Gale, Detroit—This tool is designed to simplify the removal of tires from split demountable rims. It consists of a special lever with ratchet attachment which separates the ends and permits the rim to collapse. The same tool will expand the rim and bring the ends together again. Price, \$3; dealers, \$2.

Second Man—Morgan Mfg. Co., Newport, R. I.—This tool is designed to make easier the mounting of a clincher tire. It consists of a steel hook attached to a leather strap. The hook is inserted in the clincher and the strap passed around the tire and felloe; this holds the tire in position and leaves the hands free to finish the work. Price, 50 cents; dealers, 50 per cent.

Michigan Motor Specialties Co., Detroit—This is a tool of the type intended to hold the tire at one point while it is being worked on or off the rim. It has a hook which goes under the bead and a pivoted curved arm which, when the hook is inserted, is turned up and presses against the side of the tire. It is made of malleable iron. Price, 30 cents; dealers, 20 cents.

Magic—Max Machine Co., Clinton, Mass.—This tool has a tire-lifting member which is inserted under the head of the shoe to be removed. The lifter is supported by a standard which rests on the ground. When the wheel is turned by hand the lifter forces the tire out of the rim, the thrust being taken by the standard. The price has been reduced from \$5 to \$3; jobbers, 40 per cent, 5 per cent for cash in 10 days.



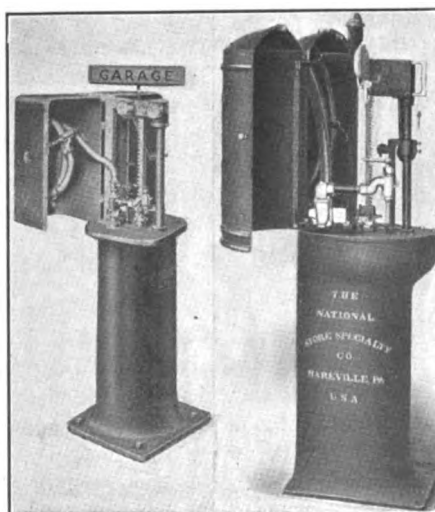
Typical curb gasoline outfits. 1 and 2, Milwaukee pump, closed and open; electric light is an extra. 3, Western with long-distance, self-measuring pump. 4 and 5, two American models which are identical except for electric light on top

Gasoline Storage Systems

Wayne—Wayne Oil Tank & Pump Co., Fort Wayne, Ind.—This curb or dispensing pump is built either with or without an electric globe topping a pillar on the casing. The cabinet is of heavy cast iron, and is in three sections, the sections at each side swinging on hinges, while the central section is stationary. The doors are fastened by a concealed spring lock. The pump has a two-way discharge, one terminating in a hose connection and the other in a lever shut-off nozzle; it discharges gallons, half-gallons or quarts at a stroke. Measuring cylinder, plunger pump, stuffing box and valves are of brass. To insure accuracy of the measuring feature the suction line is provided with a set of double brass valves. The discharge hose is of a special type to resist the action of gasoline; all gasoline pumped passes through a filter which separates out water and sediment. A discharge register tallies up to 10 gallons and the total quantity is registered by a meter of 100,000 gallons capacity. Standard equipment includes pump, two-way nozzle, tank, gauge stick for tank, fill pipe complete, foot valves, suction pipe for tank with union, filter, meter, 7 feet gasoline hose and portable nozzle. Tanks may be had in any capacity from 65 to 1,100 gallons. In the lighter tanks the rivets are cold driven and all seams are soldered.

Western—Western Oil Pump & Tank Co., St. Louis, Mo.—The line of gasoline handling apparatus manufactured includes underground tanks, garage tanks

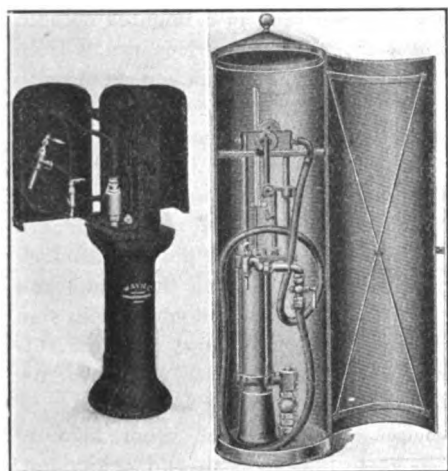
and cabinets, wheel tanks, self-measuring pumps, and curb dispensing pumps. The curb apparatus is of appropriately heavy construction; the rectangular casing enclosing the pump is of 5/16 iron and is made in two halves, which are hinged, and completely expose the pump when swung back. Overlapping joints exclude rain and dust. A Corbin six-tumbler brass lock is fitted. The pedestal is cylindrical and has a broad base to stand on. In the bottom is a small door, giving access to the drain-cock. The pump is of the long-distance type, and the underground tank may be located at any distance not exceeding 200 feet. The pump can be adjusted to measure gallons, half-gallons, quarts or pints, or 1, 2, 3, 4 or 5 gallons, and has cylinders,



Left, Milwaukee, and right, National, curb pumps, showing accessibility when opened

valves, plunger rod and stuffing box of brass; the gears are of cut steel and the balance of the construction heavy cast and wrought iron. Two and one-half turns of the crank handle are required to discharge 1 gallon, and the pumping capacity is 13 gallons a minute. The meter checks all gasoline up to 10,000 gallons; a discharge register indicates up to 10 gallons and is in view of both customer and operator. A vertical discharge pipe extends 20 inches above the casing and terminates in an automatic air vent. Pump and discharge pipe are automatically drained when pumping ceases. Dimensions: height to top of case, 54 inches; to top of discharge pipe, 75 inches; width, open, 24 inches; closed, 15½ inches; depth, 11 inches; diameter of base, 14 inches; weight, 310 pounds; the height when electric light is mounted on casing, 87½ inches. These outfits can be supplied with tanks of any size from 65 to 1,100 gallons; price, with 65-gallon tank, \$190; 120-gallon tank, \$205; 220-gallon tank, \$235; 390-gallon tank, \$280; 1,100-gallon tank, \$445. Electric light attachment, \$25 extra. A garage equipment with inside pump and outside underground tank has the pump adjusted to measure 1, 2, 3, 4 or 5 gallons at a stroke, or gallons, half-gallons, quarts or pints. Pump has discharge register, automatic shut-off and lock, and same material and workmanship as curb outfit. Tanks, 65 to 1,100 gallons; prices, with 65-gallon tank, \$110; 120-gallon tank, \$125; 220-gallon tank, \$155; 390-gallon tank, \$200; 1,100-gallon tank, \$365.

Jasco—Janney, Steinmetz & Co., Philadelphia—Seamless steel welded tanks and long-distance pump outfits are manufactured in various capacities. Pumps are made in two styles; the direct lift and long-distance pumps are of brass with cylinders 2 inches in diameter. The small pump for use with direct lift outfits has a stroke of 6 inches and the larger pump has a stroke of 13 inches. Both are self-draining, the draining valve being tripped when the plunger is pressed down as far as it will go. A self-measuring pump is made which delivers exactly 1 gallon at each stroke. Valves are double and are easily reached; cylinders are of hard-drawn brass tubing and each pump has an anti-drip shut-off nozzle and bib-cock for hose attachment. Screw-adjusted stops are provided for half-gallon and quart measurements. Price of self-measuring pump, \$55; 10,000-gallon register, \$5; gasoline hose 12 feet long with special shut-off nozzle, \$5; extra for long-distance pump with nozzle, \$10; for direct lift pump with nozzle, \$6. Long-distance outfits complete, including tank, pump and everything but line pipe, 55 gallons, \$35; 110 gallons, \$40; 220 gallons, \$70; 330 gallons, \$90; 550 gallons, \$130. Direct lift outfits, 55 and 110 gallons, \$25 and



Left—Wayne curb outfit with cabinet open.
Right—Beman cylindrical type

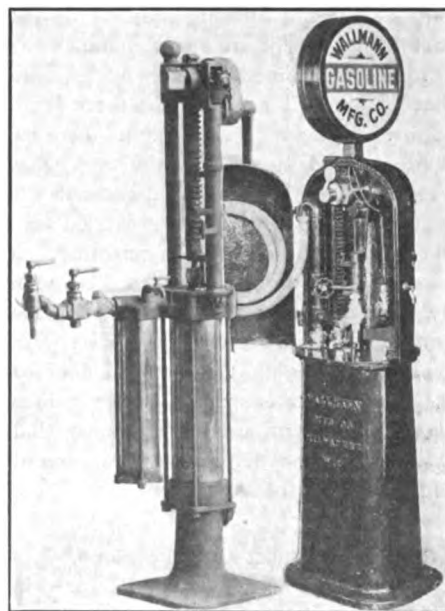
\$30. Long-distance self measuring outfits, 110, 220, 330 and 550 gallons, \$90, \$120, \$140 and \$180.

Wm. B. Scaife & Sons Co., Pittsburgh, Pa.—A specialty is made of tanks, either for gasoline or air, which are of open-hearth steel and are made up by welding instead of riveting, and all tanks of steel lighter than No. 7 are hot galvanized after being made up; the outer surfaces also are coated with rust-proofing paint. Nine sizes are made, the capacities ranging from 60 to 1,000 gallons.

Two classes are made in each size, the only difference being that the Class B tanks are of heavier material than those of Class A and are adapted to service where the requirements are severe. A 60-gallon tank, Class A, costs \$14; Class B, \$17; 110 gallons, A, \$21; B, \$25; 220 gallons, A, \$40; B, \$45; 550 gallons, A, \$91; B, \$101; 1,000 gallons, A, \$160; B, \$178. Class B tanks meet the specifications of the National Board of Fire Underwriters while the lighter tanks do not. Other products include Reliance long-distance pumps, which are of the direct lift plunger type and are furnished with or without discharge faucets. When faucet is fitted it is of the anti-drip pattern. Cylinder, faucet and valves are of brass and other parts of malleable and cast iron.

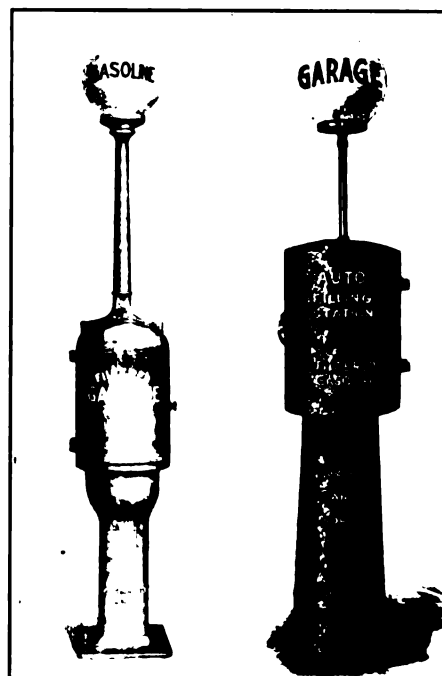
Beman—Beman Automatic Oil Can Co., Meadville, Pa.—A curb gasoline station is made which differs from most apparatus of its kind in that the pump and auxiliaries are enclosed in a cylindrical casing 17 inches in diameter and 58 inches high with a full length door. The pump is a self-measuring long-distance model, delivers a gallon at a stroke and can be set to deliver half a gallon or a quart. A discharge counter indicates up to 15 gallons; a 10,000-gallon total meter can be attached at an extra cost. The delivery hose is 10 feet long; there is also a faucet for filling pails or cans. Tanks for underground storage can be furnished in any capacity from 65 to 1,000 gallons. The same pump and auxiliaries are mounted on a base for open use in garages. Another garage pump is of the rotary type, operated by a crank, discharging through a meter with total register up to 10,000 gallons and unit dial reading in quarts, half-gallons and gallons up to 10 gallons. Gasoline filters, oil cans and heavy oil handling and storage equipments also are produced.

Pennsylvania—National Store Specialty Co., Bareville, Pa.—Curb pump outfit is built with heavy cast iron base and cabinet, the latter being hinged at the back and swinging out in two halves, completely uncovering the pump. The pump is geared and crank-operated; the rack operating the plunger is cut from solid steel. The equipment consists of a 15-gallon discharge counter and a 10,000-gallon total meter, hose, faucet and filter. Finish is red and nickel. The measuring device is adjustable and the stops can be sealed in place. Tanks for underground installation can be furnished in any capacity.



Two types of the Wallman Mfg. Co.'s gasoline dispensing outfits for curb service

Hydraulic—Hydraulic Oil Storage Co., New York—No pump is needed and none is supplied with this system. The bottom of the gasoline tank is connected to the water mains by a pipe and when water is admitted gasoline is forced out; the difference in the specific gravity of the two liquids keeps them sharply separated. When all the gasoline has been forced out the tank is full of water, which is automatically discharged into the sewer when the tank is refilled with gasoline, which is accomplished in the usual way. A gauge shows the height of gasoline at all times. Curb outfits consist simply of a suitable hydrant with the neces-



Left—Gilbert & Barker's curb pump. Right—Milwaukee pump with electric globe

sary valve; the housing may be of the cast iron type or of sheet metal. The advantages claimed for the system are that no pump is needed, that there is no opportunity for evaporation because there never is any air in the tank, that water and dirt sink into the water in the bottom of the tank and are carried into the sewer, that only clean gasoline can be discharged as it is always taken from the top, and that the operation of the system is rapid and inexpensive. An overhead swinging arm is provided for use where there is space for it; it swings like a washer arm and has a hose so that gasoline can be delivered at any point within a radius of 25 feet.

Cleveland Faucet Co., Cleveland, O.—A single garage outfit is manufactured in 66 gallons and 120 gallons capacity. The pump is made entirely of brass with 2-inch cylinder and 12-inch stroke; the pumping capacity is 4 gallons per minute. Tanks are of heavy welded joint steel and are tested at from 150 to 200 pounds pressure. Price, suction pump with faucet, \$7.50; 66-gallon steel storage tank, with bushing and inside draught tube, \$21; 20-gallon steel storage tank with bushing and draught tube, \$37.50.

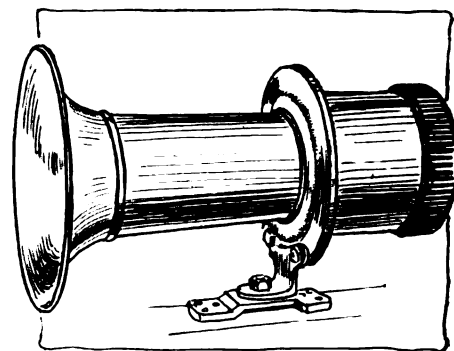
Gilbert & Barker Mfg. Co., Springfield, Mass.—A cast iron base of rectangular form carries a cabinet which swings open back and front. The pump measures in gallons, half-gallons and quarts and the measuring stops can be set and sealed by the local weights and measures inspector. The stops are carried on a heavy threaded rod to prevent their shifting and no set-screws are used. The pump is fitted with a 10-gallon discharge register, a 100,000-gallon total register, hose, filter, faucet discharge and locks for the doors. Tanks can be furnished in any desired capacity for underground storage.

Milwaukee—Milwaukee Tank Works, Milwaukee—Type 37 roadway filling station has a crank-operated pump mounted on a tapering column and enclosed in a cabinet which swings open at both sides. The pump is of standard geared self-measuring design, requiring $2\frac{1}{2}$ turns to discharge one gallon; adjustable measuring stops may be set for half-gallons or quarts. A discharge register indicating up to 10 gallons is fitted, as well as total recording meter. Tanks are supplied in any desired capacity and have riveted and soldered seams and are galvanized. Type 31 is an open pump, self-measuring and discharging one gallon with three turns of the handle. It has

adjustable measuring stops for half-gallons and quarts, 10-gallon discharge register, non-dripping faucet, drip pan with grate, large double valves and $1\frac{1}{4}$ -inch suction pipe. Height over all, 50 inches; floor space, 12 x 12 inches. This pump is for garage use in connection with exterior underground tanks. Type 70 is a lever-operated plunger pump, non-measuring, and Type 71 is a crank-operated rotary pump which is especially adapted in handling heavy liquids such as lubricating oil. Both are mounted on cast iron bases. Garage oil cabinets and plain direct-acting plunger pumps also are made.

American—American Oil Pump & Tank Co., Cincinnati—Curb outfit No. 101 is mounted on a tapered column; the sides of the cabinet are hinged to swing downward and outward. The pump is double-acting, single-cylinder, continuous flow and adjustable to measure pints, quarts, half-gallons and gallons; all quantity stops are sealed in place at the factory. Four and one-quarter turns of the crank pumps 1 gallon. The equipment consists of a locking device, 8 feet of hose with nozzle, flexible two-way discharge and discharge register. A specially designed filter and a high capacity meter are furnished at an extra charge, as is also an electric globe carried on an iron pillar on the top of the cabinet. The same pump, actuating mechanism and other attachments may be had in open type for inside service; also a single-acting pump of the same capacity but less rapid in action. Other products include a 50-gallon wheel tank with rubber tired pressed steel wheels; double-acting pump, meter and complete equipment; single-cylinder, non-measuring, double-acting, lever-operated pump on heavy cast iron base with cylinder mounted horizontally; vertical cylinder lever-operated pump; cabinets, basement outfits and oil and gasoline tanks of all sizes.

Vac Pump—The Vac Liquid Equipment Co., Cedar Rapids, Mich.—The latest product is the Bulward gasoline filling station which is of the pillar type and may be operated either by hand or electric pump; in the latter case the cost of operation is given as about 5 cents per 1,000 gallons. The outfit is equipped with an electric sign carried on a pair of columns. Electric lights are provided for every outfit. The electric pump switch may be operated by the same key that is used for locking the cabinet. Prices vary greatly with the equipment desired, ranging as high as \$400. Gasolene meters, tanks and pumps



The Boyce hand horn has a milled-edge hand wheel or disk instead of a lever or plunger

and various other gasolene handling devices are manufactured.

Tokheim—Tokheim Mfg. Co., Cedar Rapids, Ia.—Underground storage tanks from 65 to 16,000 gallons capacity, pumps for private and public garages, curb pump outfits, portable tanks, measuring pumps and oil handling apparatus are produced. A new model is a private garage outfit which has an overhead hose to drop into tank, an indicator on the nozzle which shows when the tank is full, a pump with automatic drainage device which clears pump and pipe line of gasolene and a holder that keeps the nozzle out of the way when not in use. The makers state that 10 gallons can be put in the tank in 3 minutes without soiling the clothes. Prices range from \$33 with 65-gallon tank, to \$128 with 560-gallon tank. A new cabinet outfit for handling oils is made in all sizes and may be mounted in batteries; pumps have quick repair cylinders and are of the adjustable measuring type. The curb post outfit has housed pump with lock on door and another on the pump, and a 27-inch illuminated double disk sign at the top. Tanks, pumps and other fittings vary according to requirements. Air and water pipes may be run in same housing. Prices range from \$175 to \$292, according to tank and equipment. The line includes a very wide range of other gasolene and oil handling apparatus. Prices have been reduced in many cases.

Taylor—Taylor Mfg. Co., Montclair, N. J.—This line consists of seven sizes of gasolene tank-and-pump outfits—60 gallons, \$24; 110 gallons, \$29; 165 gallons, \$36; 225 gallons, \$43; 275 gallons, \$54; 385 gallons, \$71, and 550 gallons, \$99. Each outfit includes a No. 1 pump, spigot, lock and chain, tank, dip-suction and filling pipes and brass cap, complete and ready for installation. No. 1 pump is all brass except the iron handle and its capacity is $\frac{1}{2}$ -pint per stroke. A hose is

provided which makes it possible to pump direct into car tank. The pump is self-draining. Tanks are welded, galvanized inside and out and coated with rust-proof paint.

Wallman—Wallman Mfg. Co., Milwaukee, Wis.—The Wallman curb-pump outfit has cast iron weather-proof housing with two doors and is surmounted by a two-faced illuminated disk sign. The pump is self-draining, has a 10-gallon counter, two-way discharge, anti-drip faucet and, at an extra charge, a 10,000-gallon indicator. The pump is operated by a crank, pinion and rack. Lever pumps, measuring and non-measuring, direct acting plunger pumps, tanks, cabinets, battery oil storage systems also are manufactured.

Eastern—Eastern Oil Tank Co., 146 Fletcher street, Lowell, Mass.—The line of gasoline handling outfits has been continued unchanged and a new model, a curb outfit, added. This consists of a measuring pump enclosed in a cast iron casing. The pump is double acting, measures 1 gallon at a time and has two-way nozzle, shut-off valve and hose; a separating funnel is included in the outfit. The price of the pump is \$68 and of the cabinet \$65; the tank may be of any size and its cost will depend upon its capacity. Other products include the Junior private garage pump with positive registering meter recording up to 99,990 gallons at \$38, or \$15 less without meter; runabout outfit with self-measuring pump and 60-gallon tank, \$168; also lubricating oil cabinets, small outdoor cabinets and separating funnels.

Koven—L. O. Koven & Bro., New York—This company makes a specialty of tanks which are made in all sizes from 1 gallon to 10,000 gallons. The interiors

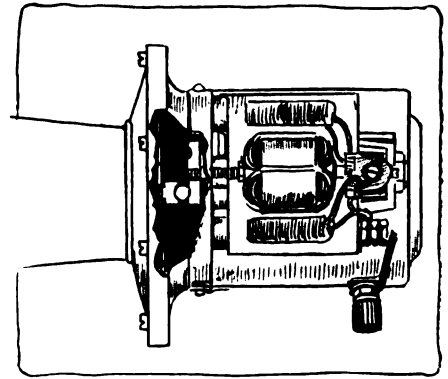
are coated with lead to resist the action of gasoline.

HORNS

Safeguard—Duplex Electric Mfg. Co., Pittsburgh, Pa.—Both motor-driven and hand-operated horns are produced, the former in three models and the latter in one. The most prominent feature of all is their extreme simplicity and the ease with which they may be adjusted without the necessity for removing them from the car. In the motor-driven horns, the motor is mounted with its armature at right angles to the diaphragm and may be removed intact by taking out three screws. The motor drives a notched rotor and there is a small steel ball between this rotor and the button on the diaphragm, the result of the construction being that there is virtually no lateral push on the diaphragm button. The tone, therefore, is clear and resonant. The hand-operated horn utilizes a train of gears, with a notched rotor; this complete rotor can be removed quickly and easily, or adjusted by simply loosening two set screws after the cover has been taken off. There is no necessity for removing the horn from the car for repair or adjustment. Both hand and motor horns come in all finishes, prices being as follows: Motor-driven, 12-inch, \$10.50; 9-inch, \$9; 7-inch, \$7; hand horn, \$5.

Long—H. W. Johns-Manville Co., New York—This line includes the new electric motor horn at \$10, price including button and cable. Vibrations of the diaphragm are produced by a pin in the center of the diaphragm which comes in contact with rollers in a weighted rotor driven by the motor. This system is designed to reduce friction and economize current. Hand-operated horns are made in four types, the largest of these being Model S, \$12.50; Model J is not so large, \$7.50, and Model F, \$5. The latter is special Ford horn and the price has been reduced from \$6. Its outward appearance is unchanged, but the mechanism has been refined and improved, the result being easier operation and a better tone. A new vibrator horn, designated as the J-M, is designed for use on either 6- or 12-volt circuits; it is finished in black enamel and is 9½ inches long. Price, with push button and cord, \$4.

Benjamin—Benjamin Electric Mfg. Co., New York—A new vibrating mechanism is a feature of a small \$4 horn. The magnets are laid flat, parallel with



The Safeguard motor horn in which a ball between two notched surfaces actuates the diaphragm

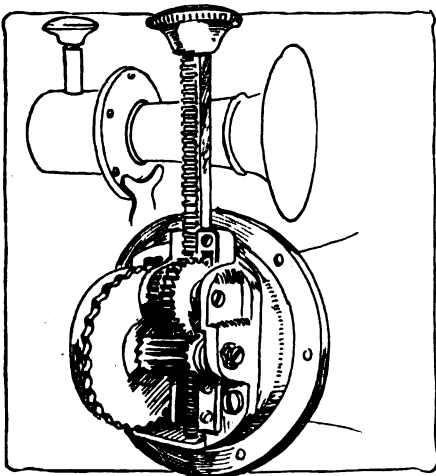
the diaphragm, and the pole pieces are beveled; the armature, which is correspondingly beveled, vibrates at right angles to the plane of the diaphragm, striking the central button in the usual way. The arrangement is exceedingly compact and simple.

New Era—New Era Spring & Specialty Co., Detroit—Both motor- and hand-operated horns are made and both are provided with adjustable jackets. The hand-operated horn is provided with a flywheel to lengthen the duration of the signal. Prices, motor-driven, \$6; hand-operated, \$5.

Boyce—The Boyce Co., New York—A hand horn in a single model is made which differs from other hand horns in that the mechanism for vibrating the diaphragm is set in motion by turning a large milled rim at the rear of the casing. The rim is slightly larger in diameter than the casing and looks as if it formed a cap or cover; it adds rather than detracts from the appearance of the horn. The finish is black and nickel and the price \$6.

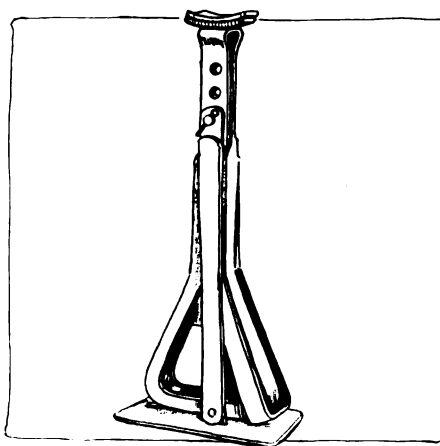
Garford—Garford Mfg. Co., Elyria, O.—Gears have been eliminated in favor of a chain and sprocket in this horn, which sells for \$4.25. The construction is simple in the extreme, the rack bar operating a shaft carrying the large sprocket and the small sprocket being mounted on the shaft carrying the toothed rotor which causes the diaphragm to vibrate.

Ka-Ha-Co.—Kales-Haskel Co., Detroit—A single model is produced and is of the electro magnetic type operated by a 6-volt storage battery or four dry cells. No changes have been made in design or construction. The finish is black and brass, all black or black and nickel. Price, \$5.



The Safeguard horn is adjustable without removing the mechanism or the horn itself

Nonpareil—Nonpareil Horn Mfg. Co., New York — Motor, electro-magnetic, hand and bulb horns are manufactured; the motor of the former has been improved and the vibrator of the second has been made self-adjustable. The motor horn is made in round and oval types and is adjustable from the outside; the armature can be inspected and the commutator cleaned without taking the horn apart. Price, \$12. The self-adjusting vibrator horn has reversible contact points which can be turned to present a new surface. Price, \$5. The Model A hand-operated horn has the projector bent at an angle of 90 degrees, the gear-case being surmounted by the push button. It is also made with straight projector; price, \$6 either type. Bulb horns are made in all sizes.



The Boyce jack is extremely simple; it lifts by a single stroke of the lever and is self locking

to the proper hole in the lifting bar. The lift is $1\frac{1}{4}$ inches and but one stroke of the lever is required; the lever locks when the center has been passed. Price, per set of four, \$6; dealers, 50 per cent.

Hoco—Hoeft & Co., Chicago—This is of the tire relieving type and consists of a pair of standards with the vertical bar clamped between them; the bar can be adjusted by moving a bolt from one hole to another. Weight per set of four, 24 pounds; adjustment, 12 to 20 inches; price, \$4.

Giant—S. B. R. Specialty Co., East Orange, N. J.—This is a heavy service jack, operated by worm and gear, the worm being turned by a T-handle on a universal joint. The lifting screw is enclosed in a telescoping column. The height is 8 inches lowered and $16\frac{1}{2}$ inches extended, and the weight 8 pounds. Price, \$5.

Adams—Adams Jack Co. of America, Hellman Bldg., Los Angeles, Cal.—Screw type turntable jack lifting center of axle and turning on two castor wheels; weight 90 pounds, height $8\frac{1}{2}$ to 16 inches, capacity 4 tons. For garage service.

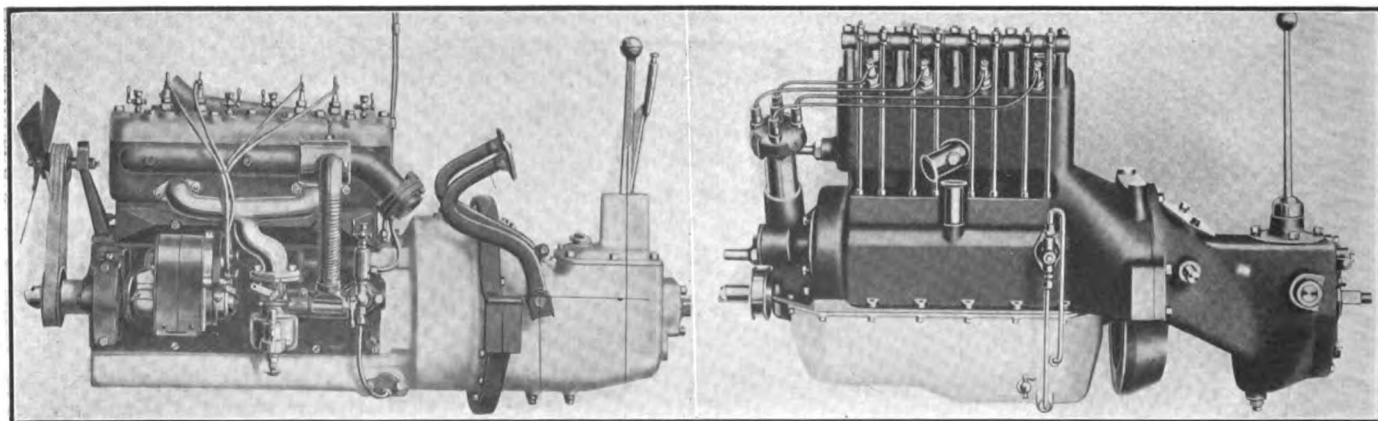
Eureka—Ashland Mfg. Co., Ashland, O.—Screw and ratchet type jacks are manufactured in all sizes. The Eureka Babe is a light screw jack with ratchet and bevel gear operation; adjustment, 9 to 15 inches; for cars up to 1 ton; price, 90 cents. The Junior is a larger jack of the same type for cars up to 3,800 pounds; adjustment, 10 to 17 inches; price, \$1. Both these jacks have open columns, but the Eureka screw jack, which is made in three sizes, all suitable for cars up to 4,500 pounds, has an enclosed column. Adjustment, 8 to 13 inches, \$1.25; 10 to 17 inches, \$1.25; 12

JACKS

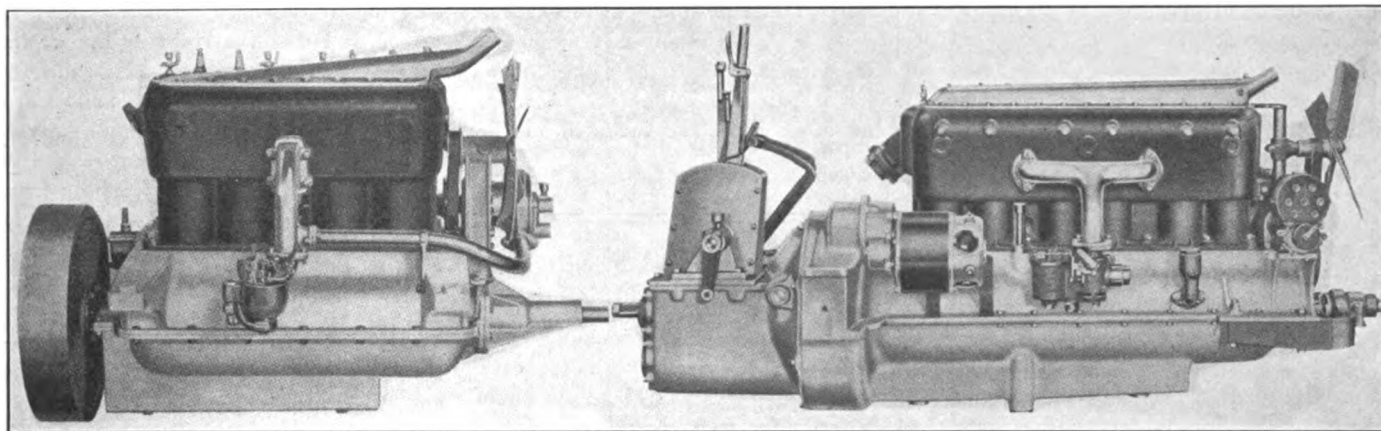
Lane—Lane Bros. Co., Poughkeepsie, N. Y.—The Lane jacks have been on the market for several years and are made in four sizes, with lifting capacities of from 1,800 pounds to 3,000 pounds. All models are of the ratchet type with a pressed steel U-shaped barrel open at the handle side. The pawls are close to the lifting bar and the lifting lever or handle has a slight bend so that the height of its swing may be varied by reversing it. Each model is equipped with two small trip levers, by means of which the lift bar may be dropped without working it down, notch by notch, when there is no weight upon it. The prices vary from \$1.50 to \$2.75 net. Lane garage door hangers, designed to open sliding door against a wall at right angles to the opening are particularly designed for wide doors which must be kept inside of the building. The device consists of U-shaped pressed steel tracks placed above

the door and on the wall at right angles to it and two small four-wheeled carriages which support each end of the door on a swivel screwed into the top of the door through an iron plate. The swivels are threaded and are fitted with a small threaded washer by means of which the door may be slightly lowered or raised to make it hang level. The tracks and carriages are made in two sizes, for doors weighing respectively 350 pounds and 1,000 pounds. The pressed steel track sells at 20 cents per foot for the small doors and 50 cents per foot for the large doors. Pairs of carriages for both sizes of tracks sell for \$4 and \$7, respectively. Track brackets sell at from 20 cents to 75 cents. Dealers' discounts are 50 per cent on all stocks.

Detroit—Auto Jack Works, La Grange, Ind.—Only one model is made, this having sufficient capacity for the average touring car or for light trucks. The end of the handle is pivoted directly to the lifting bar and to a fulcrum which is sufficiently close to give ample leverage. The height of the jack is adjusted by moving the pivot in the end of the handle



Left—Golden, Belknap & Schwartz four-cylinder block unit power plant Model 31, $3\frac{3}{4} \times 4\frac{1}{4}$. This is the latest model; there are two other four-cylinder unit power plants embodying much the same general features of design. Right—Sterling valve-in-head motor for light car service. These motors are built both with and without gearset attached. Cylinders are block cast and are integral with upper half of crankcase; head is detachable and is waterjacketed



Wisconsin motors are made in a wide range of sizes in both four- and six-cylinder types and in unit power plants and independent models, L-head and T-head. The oiling system is the same in all models and is of the forced type, oil ducts leading through the crankshaft and being thrown out at the connecting rod bearings

to 21 inches, \$1.50. Heavier jacks are made in screw and rack types as well as storage and tire saving jacks.

SPARK PLUGS

Red Head—Emil Grossman Mfg. Co., Inc., Brooklyn, N. Y.—Four improved models are the Platinum Point, Big Boy, Priming and Combination. The Big Boy at \$1 is built in three separate units and is a substantial plug. The porcelain is heavy, the terminal screw is baked into it, and the large heat-treated steel bushing has wide gripping surfaces. There are three firing points of heavy nickel steel. The priming plug, at \$1.25, has a passage through the wall of the shell; the gasoline flows over the surface of the porcelain and drips directly to the sparking points. The plug can be cleaned without removing it from the cylinder by opening the pet-cock, through which carbon is blown out. The porcelain is straight sided, the bushing of steel, and the points of heavy meteor wire. The Platinum Point plug, at \$1.50, is made for the most exacting class of service. It has a screw cap sunk and baked into the porcelain so that it cannot be broken off or twisted; porcelain is straight sided, petticoat or conical. The porcelain may be removed without taking the shell from the cylinder. Bushing and shell are of steel with blued finish; center electrode and firing pin are of imported meteor wire. The Combination plug, at \$1.25, has a core of mica and porcelain, the center being of rolled mica surrounded by a tube of mica washers and an exterior shell of porcelain. The shell and bushing are very heavy and the finish is in nickel. The terminal is of the combination type and of brass. The porcelain insulating shell extends into the firing chamber because of the resistance of porcelain to heat.

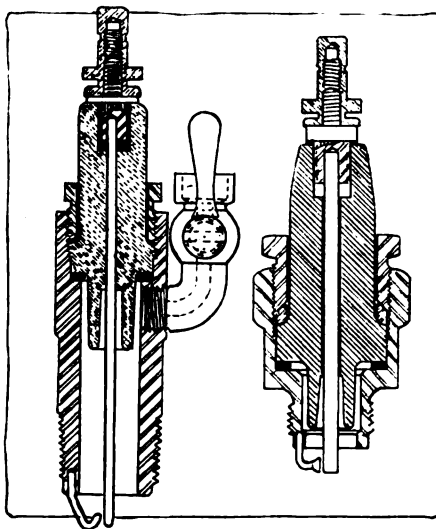
Power & Efficiency Co., 137 East State street, Trenton, N. J.—Both electrodes of this plug are insulated, providing two paths for the current; two plugs in one cylinder can be wired in series to give two simultaneous sparks, or one plug can be used with a double wiring system; also a single plug can be used in the ordinary way by grounding the outer electrode by turning down a small switch mounted on the side of the plug for the purpose. All standard sizes are made. Price, \$1.

Splitdorf—Splitdorf Electrical Co., Newark, N. J.—Plugs are made with both mica and porcelain insulation and in all threads. The Common Sense plug has mica core. Price, \$1. Service plug, porcelain core, \$1. These plugs have been standardized for several years and no recent changes have been made.

Blitz—The Randall Faichney Co., Boston—This plug has a double core, having a center of mica and a shell of porcelain,

the object being to produce a plug that will not break down in case the porcelain is cracked and in which the core will be less easily broken than if it was made of porcelain only. A single central electrode and two shell electrodes are used. All sizes are made. Price, \$1.

Mosler—A. R. Mosler & Co., New York—Seven models are made, Spitfire platinum point, Spitfire magneto point, Spitfire conical, Vesuvius, Triumph, Junior and Motorcycle. The platinum point plugs are carried in stock in ½-inch metric and ¾-inch sizes; the ½-inch and ¾ are made in standard, long and extra long, the ¾ in an extra short model and the metric in standard only. Price, ¾, \$3; ½-inch and metric, \$2.50. The magneto plug has nickel points; price, ½-inch, \$2; metric, \$2; ¾, \$2.50. Vesuvius with steatite core, \$2. Conical type, open end construction, ½-inch, \$1.50; ¾, \$2. Triumph, with deeply recessed core, all sizes, \$1. Junior, for magneto, \$1.



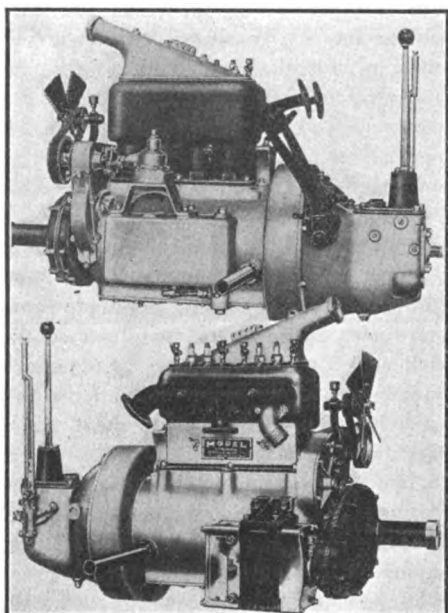
The new Red Head plugs have the terminal screw cemented and baked into a cavity in the top of the porcelain so that it cannot be twisted or broken; left, priming type; right, "Big Boy"

MOTORS

Model—Pittsburgh Model Engine Co., Pittsburgh—Two motors are being manufactured, one a four and the other a six; the former has cylinders 2¾ x 4½ and the latter 3 x 5. Both are block-cast and have L-heads and are built as unit power plants, the six having either multiple-disk or cone clutch and the four a disk. The six has a three-bearing crankshaft 1¾ inches in diameter. Lubrication is by constant level splash with oil circulated by plunger pump; the camshaft is submerged in oil. A centrifugal pump circulates the cooling water and is mounted on the right side together with a mounting for the magneto. Provision is made on the left side for generator and starting motor to be driven by silent

chain running in oil. Weight of motor only, 350 pounds; motor, clutch and gear-set, 450 pounds. The four-cylinder motor has a two bearing crankshaft running in babbitt-lined bronze bearings. Cooling is by thermo-syphon and oiling by automatic constant level splash. The crankcase, which is of aluminum, is of the barrel type with removable bottom plate. Timing gears are helically cut. Mountings are provided for magneto or distributor. Weight of the engine alone is 150 pounds, and of the unit power plant with pedals and control set, 210 pounds.

Wisconsin—Wisconsin Motor Mfg. Co., Milwaukee—Both four-cylinder and six-cylinder models are built, and both L-head and T-head are employed. The



A Pittsburgh Model motor, unit power plant type, designed for light car service

Wisconsin lubricating system is of the force type; a gear pump in the lowest point of the oil reservoir forces oil into the main duct which is cast in the crankcase and from which branches drilled through the webs lead to the main bearings. At the main bearings the oil enters the hollow crankshaft, and is carried to the connecting rod bearings, from which the surplus is splashed on the pistons, piston rings and camshafts. A separate lead runs to the timing gears. Among the numerous four-cylinder models are include a $3\frac{3}{4} \times 5$, a 4×5 , the latter built for either individual or unit power plant mounting. $4\frac{1}{4} \times 5$; these are all of the L-head type with block-cast cylinders. A T-head motor, $4\frac{1}{4} \times 5$, has pair-cast cylinders, and the same is true of a $4\frac{3}{4} \times 5\frac{1}{2}$ model, which is built for unit or individual mounting. The largest of

the four-cylinder motors is of the T-head type, $5\frac{3}{4} \times 7$, with pair-cast cylinders, and the largest six has the same dimensions and pair-cast cylinders. A number of other sizes are included in the line.

LAMPS

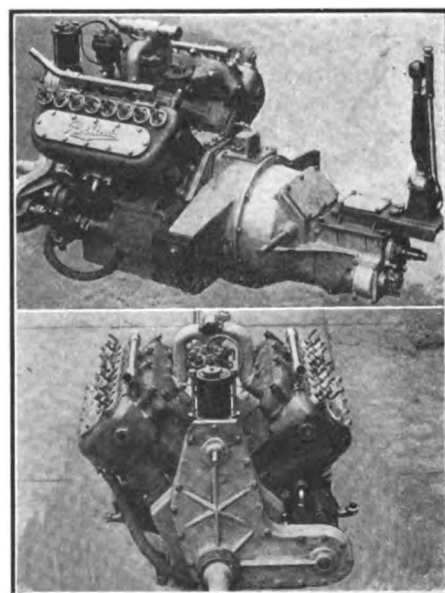
Solar—Badger Brass Mfg. Co., Kenosha, Wis.—Line of lamps includes practically every type used for motor cars. Electric headlights have hingeless doors which fasten by bayonet catches and cam lock; a washer between the back of the front glass and front of reflector excludes dust and moisture. Focusing is effected by turning the bulb. Body and roll are of a single piece of metal. Any combination of double bulbs, single bulb, single hollow prop bottom bracket or double side prop for fork brackets can be supplied. Alpha double flared French type electric headlight, 11-inch, 21 candlepower Ediswan Mazda double wire bulb, brass and black or brass and nickel, \$15 per pair; full nickel, \$17. Omega, same characteristics but parabola shape, \$14 and \$17. Supreme double flare type, 10-inch, 15-candlepower bulb, \$12 and \$14; Superb, parabola type, $10\frac{1}{2}$ -inch, 15-candlepower bulb, \$11 and \$13; $11\frac{1}{2}$ -inch, 18-candlepower bulb, \$12 and \$14. The lowest priced headlight is the Simplex, flared parabola shape, silver plated reflector, spring ring and lock glass fastening, outside focal adjustment, 8-inch with 12-candlepower bulb, \$8.50, any standard finish; 10-inch, 15-candlepower, \$9.50 and \$11.50. Searchlights on swivel brackets are of similar construction to Superb type except for swivel universal mounting and larger bulbs. Price, $10\frac{1}{2}$ -inch, 21-candlepower, black and nickel, \$14.25; brass and nickel, \$15.50; $11\frac{1}{2}$ -inch, 24-candlepower, \$16.75 and \$18. Nitrogen-filled 50-candlepower bulb, 75 cents extra. Double flare side lights to match same type headlights, \$10.50 and \$11.50; parabola body side lights, \$9.50 and \$10.50. Limousine side lamps, octagon and round tail lights, acetylene headlights and generators, light controllers are other products. In the electric lamps options are given on bulbs of various candlepowers and voltages.

Neverout—Rose Mfg. Co., Philadelphia, Pa.—Two new types of electric tail lamps, one of them combined with the Neverout license bracket, have been brought out. There is no solder in the entire construction and all parts of the lamps are interchangeable. The one without the license bracket has the wires

entering at the back so that it may be placed at either the right or left of the bracket pin. It sells at \$2, while the combination type lists at \$2.50. The new front license bracket attaches directly to the water filler and sells for 75 and 50 cents. Neverout brackets for both front and rear license plates are made in all styles and sizes. They sell for 75 cents in black enamel and for \$1.50 in brass.

Culver-Stearns Mfg. Co., Worcester, Mass.—The line consists of dashboard and extension lamps and a small searchlight. The latter is but 3 inches in diameter and has a tungsten bulb of 8 candlepower, self-contained switch and focusing device. It is designed to attach to the windshield frame or other point by means of a clip bracket, the lamp being on a universal joint. Cable and connector are used to carry current from battery. Price complete, \$4. Dash lamp on 45 degree elbow, hemispherical hood, self-contained switch and 2 candlepower bulb, any standard voltage, \$1; with long-shank standard, \$1.25. Cylindrical hood dash lamp to set close to dash, with bulb, \$1.15. Another lamp at the same price has hood opening only $\frac{7}{8}$ inch from the dash. Extension lamp with wood handle, self-contained switch, wire guard, bulb and reflector, 10-foot cord and bayonet connector, \$1.85. Large hand lamp with 3-inch lens, 8-candlepower tungsten bulb, self-contained switch, 10 feet cable and connector, \$2.50.

Holt & Beebe Co., Boston—This line includes chiefly lamps of the more ornate

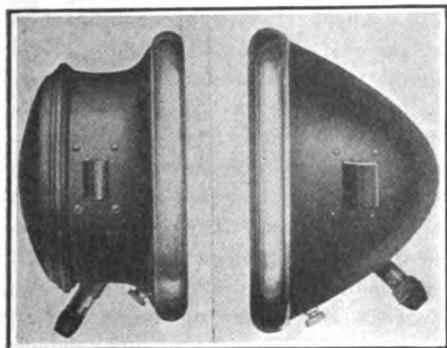


The Perkins 8-cylinder motor, manufactured by the Massnick-Phinos Co., is of the dual-block V-type with the connecting rods yoked together in pairs and a four-throw crankshaft; a single camshaft actuates all the valves

types, such as are used for interior illumination and side lights for enclosed cars; tail lamps also are made. All are electric. Limousine pillar lamps, \$30 per pair; limousine corner lights with switch, \$17 per pair; without switch, \$15 per pair; dome lights, \$4 and \$5.50 each; cape top lights, \$3.50 each. Dealers, 50 or more, 40 per cent; less than 50, 33½ per cent; less than 25, 25 per cent.

Monarch—Fowler Lamp & Mfg. Co., Chicago—This is of the attachable type and consists of a frosted celluloid disk with a white center, which is clipped to the front of the lamp glass on the outside, though in the case of an electric lamp can also be placed inside. The glare of the lamp is eliminated, but the road is adequately illuminated. Price, \$1 per pair, any size.

Cuno—Cuno Engineering Corp, Meriden, Conn.—This line consists of small



Two representative Solar electric lamps; left, double flare French, and right, parabolic model

lamps of the dash and extension types. Type EB, self-winding combination dash and extension lamp, has steel casing to go back of the dash; the lamp has a cylindrical hood and when the flexible cable is wound extends a short distance from the dash like an ordinary instrument lamp. Price, with 15 feet of cable, no bulb, \$4.25. Smaller types with shorter cable, \$3.25, \$3.50 and \$4. Close coupled dash lamp, removable cylindrical hood which can be removed to attach cord and used as an extension lamp, without bulb, 90 cents. Same lamp with switch operated by turning hood, \$1.15. Extension lamp in telescopic tube which slides to partly shade or enclose lamp, flexible bronze guard, reel frame and 10 feet cord, \$1.50; with 15 feet cord, \$1.65.

Victor—The Victor Lamp Co., Cincinnati, O.—Product includes electric, gas and oil lamps and acetylene generators. Electric head lamp with rectangular door rim 9½-inch, \$8; 11¼-inch, \$12 per pair; with curved door rolls, 9½-

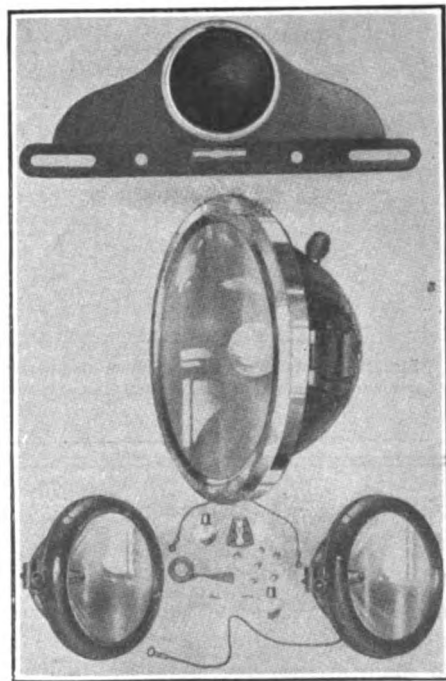
11¼- and 12-inch, \$6, \$10 and \$14 per pair. Ford headlights, 9½-inch, complete with wiring, bulbs and switch, \$12 with black doors and \$15 with nickel. Gas headlight, 9¼-inch, with silver front reflector, \$6.50 each; 9-inch gas headlight for light cars, \$5 each. Electric side lamps, 6-inch, hinged door with roll front, \$7.50 per pair. Electric side lamps, 6-inch, with wide flange and reduced lens, \$6 per pair. Round tail light, oil, 4¼-inch door, \$3. Combined tail light and license bracket, electric, extreme length, 11 inches, depth, 1 inch, \$4.50. Round type electric tail light, 3¼-inch ruby glass, \$2.75. Acetylene generators, \$3 each.

Single Cell Battery Lamps—Asch & Co., Inc., New York—Two electric lamps of the one dry cell type, one of which consists simply of a small lamp with a reflector, mounted on top of a dry cell by the simple process of screwing the bracket of the lamp under the central terminal nut; the other terminal is connected to the lamp by a short wire, and a handle is provided for carrying. The Alexander lamp is of the lantern type and has a metal casing for the cell; the bulb is mounted in a reflector at the side and there is a handle at the back and one on top. The price is \$1.50 with black finish and \$2 in brass or nickel.

Newtype Lamp and Mirror—Wood Mfg. Co., Fairfield, Conn.—An ingenious lamp is mounted on a universal bracket and can be pointed in any direction for sign reading; a small concentrating mirror is set on the back of the lamp casing and serves as a rear view glass; its form is such that it includes in a small area enough of the road behind the car to permit the driver to see what is going on behind his machine.

Step-o-lite—Bass-Moody Co., Peoria, Ill.—This lamp is of the type which utilizes a single dry cell and is exceedingly simple. A spring clip carrying the reflector and bulb snaps around the body of the dry cell and a wire handle attached at one end to the clip and at the other to one of the battery terminals. A short wire completes the circuit. Price, to dealer, without dry cell, 35 cents; retail price, with dry cell, 75 cents.

Dash Lamps With Switches—J. H. Faw, New York—Dash and extension lamps, incorporating a convenient switch, operated by a stud. One of these is a clock lamp with a bowl-shaped hood; the price is \$1. A speedometer lamp

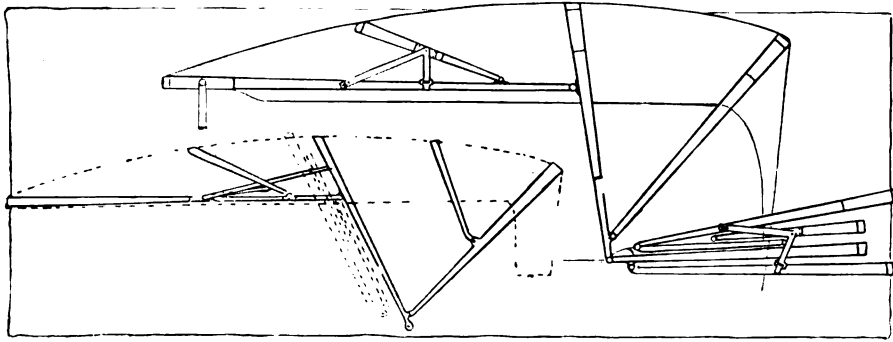


A group of Victor electric lamps. Lower, special Ford set, complete with wiring and switch, selling for \$12 to \$15

with switch costs \$1.25; these prices include bulbs. These lamps are also made to fit into sockets in the dash, from which they can be removed and used as extension lamps by attaching cables. The discount allowed to dealers is 33½ per cent.

Kaufman—Chas. Kaufman, Santa Ana, Cal.—A single lamp is made, a small searchlight designed to be flexibly mounted on edge of windshield or dash. It is 6 inches in diameter, can be operated from a storage battery or direct from a Ford magneto. Can be removed from bracket and used as an extension lamp. The bracket clips to the edge of the windshield and the lamp is carried on joints which permit it to be pointed in any direction that may be desired. Price, \$7.50.

Hampton Glareless—Hampton Glareless Lamp Co., New York—This lamp is designed to eliminate diffusion of light and to project a perfectly straight beam. These objects are accomplished by mounting in the lamp directly in front of the bulb a tubular member, which catches and throws forward the stray rays which would otherwise scatter. The Hampton lamp, Cadillac model, is 9½ inches in diameter and the price is \$26 per pair with 6-volt bulbs of 15, 18, 24 or 50 candlepower. Packard type, 9½ inches diameter, \$40 per pair. Standard model is 9 inches in diameter; price, \$20 per pair.



Structural details of modern types of one-man tops, showing simple means of obtaining rigidity without numerous points of attachment to car body. Upper—American Top Co.'s product. Lower—Bondy Mfg. Co.'s top

TOPS

Golde—Golde Patent Mfg. Co., New York—Only detail changes have been made, the design and general construction remaining unaltered. Refinements in minor matters have permitted the construction of a top which is only 6½ inches high when folded. The regular tops are made in five types, Type 17, three-bow, roadster, up to 68 inches long; Type 15H, four-bow, for four- and five-passenger cars, from 69 to 98 inches; Type 15K, five-bow, for five-, six- and seven passenger cars, from 107 to 116 inches long, and Type 15E, five-bow, for six- and seven-passenger cars, in lengths over 116 inches. Plain detachable curtains in two, three or four sections are regular equipment; Collins or Jiffy curtains supplied on order. Owing to the great number of different body dimensions on the market it is impracticable to carry complete stocks of tops, but parts have been standardized and construction is quick. Materials and finishes are always specified by purchasers. Tops can be built to fit any existing irons, though in many cases it is more convenient and makes a better job to use new irons; only two are needed, one on each side. Prices vary greatly with quality of materials. Roadster tops range from \$45 to \$100, averaging \$55 or \$60; five-passenger touring, \$75 to \$100, averaging \$80 or \$85; seven-passenger touring, \$100 to \$125.

Buob & Scheu, Cincinnati—Tops are manufactured for car builders. A new one-man top is built in four- and five-passenger types and furnished with either Jiffy curtains or special curtains designed by the manufacturers. Any materials may be had.

Holden—The Holden One Man Top Co., New York—A special model is manufactured for the Ford car. It is of the one-man type and can be operated from

within the car. Made of khaki cloth, the price is \$40; of silk mohair, \$40, and of Ford rubber cloth, \$35. Tops are also made for other standard cars on the market. A special feature of the Holden top is its strength; it has sufficient rigidity to permit a man to stand on it when extended.

The Holbrook Co., New York—Three types of tops are manufactured, the one-man top, a disappearing top, which folds inside the back panels of the body and is completely hidden when not in use, and the regular victoria top. The materials used are burbank, pantasote and top leather.

Bondy—Bondy Mfg. Co., Cleveland—A specialty is made of the Bondy Fan Top, which is of the one-man type and can be operated from either inside or outside the car. Two braces hold the top rigidly so that it will withstand strong wind, the braces in the forward portion being diagonally placed. Ordinary extension tops also are made and a new style top of the convertible type will be placed on the market some time in the near future.

American Top Co., Jackson, Mich.—This company manufactures a top of its own design for a number of motor car builders, as well as building to manufacturers' specifications. The special top, which is of the one-man type, has the forward extension braced and kept in shape by a diagonal brace pivoted to an elbow brace rigidly made of metal. The design is simple and the cost of the top moderate.

J. C. Wilson Co., Detroit—Tops are manufactured for car builders only and are made to their specifications; practically all are of the one-man type, and for the most part are fitted with Collins or Jiffy curtains. The materials used are mohair, artificial leather and rubber coated goods.

TIRES

Braender—Braender Rubber & Tire Co., Rutherford, N. J.—Featuring a new non-skid tread pattern, Braender also offers plain and non-skid treads in clincher, quick-detachable and straight-side beads. The new tread is similar to that previously offered, consisting of U-shaped depressions across the tread, but has a number of small cord-like reinforcements in the depression to hold the tread together better and more evenly to distribute the pressure. Red and gray tubes are carried in all standard sizes. Prices for casings are indicated by those of the 36 x 4 size, which sells for \$25.95 in plain treads and \$31.15 for the non-skid type. Tubes for this size sell for \$5.20 in gray rubber and \$5.75 in red gum.

Dayton—Dayton Rubber Mfg. Co., Dayton, O.—The Dayton company is continuing the Dayton airless tire as before. The pneumatic product has been on the market only a few months, although the airless design has been on the market for 8 years and is largely used on fire apparatus. The pneumatic tire is not radically different from standard makes, having a non-skid tread patterned to resemble lacing. They are guaranteed for 5,000 miles, and are made in quick-detachable clincher forms only. Those whose widths are 3 or 3½ inches are clinchers, all others being quick-detachable. All have non-skid treads except 30 x 3, 30 x 4 and 32 x 4½, the latter being an extra heavy size. 36 x 4 casings sell for \$38.25, and tubes, \$5.90, other prices being in proportion. Nothing but red tubes is offered.

Economy—Dujardin Rubber Co., 1697 Broadway, New York—Economy tubes are a new product of this company. These are claimed to be proof against blowing out, pinching or rim-cutting, and consist of an extra-heavy red tube reinforced by a knitted stocking of Sea Island cotton. In the 36 x 4 size they sell for \$11.

Steel—Steel Pneumatic Tube and Tire Co., 21 West Sixty-second St., New York—A puncture- and blow-out-proof pneumatic tire that is self-inflating and that adjusts its pressure to the load is the product of this company. The tire consists of a tube or core composed of a hard rubber body with a multiplicity of steel pistons working in cylinders. These cylinders also contain air pumps operated by the pistons. The casing of the tire is similar to the ordinary type

except that the tread is reinforced inside and that it is attached to a special rim in a different manner from that customary. In both plain and non-skid design, the Steel casings are attached to a deep stamped-steel rim, made in two parts. The inside of the tread is flat to give an even bearing pressure. It is said that the casing is used solely to take the wear, having no internal pressure to resist.

In action, as the wheel rolls, the pistons one by one take the weight. As they move forward, they compress the air in the cylinders, thus acting as a cushion. They also operate the pump so as to take in a charge of air. When the wheel rolls them out from under the load again, the air pressure forces them out to a predetermined limit, so that the pressure in the cylinder falls. The pressure in the pump rises, however, and a certain amount of air is forced into the cylinder. The capacity of the pump is limited, however, to the maximum desirable pressure. The Steel tire is guaranteed for 1 year, regardless of mileage. It sells for \$38 in the 36 x 4 size, complete and attached to the wheel, extra casings selling for \$38 each.

Marathon—Marathon Tire & Rubber Co., Cuyahoga Falls, O.—Marathon pneumatic tires and tubes feature a new angle tread non-skid device consisting of a number of V-shaped rubber projections distributed evenly over the tread at varying angles. Marathon tires are also made in all millimeter sizes. Both smooth-tread and angle-tread casings are available in all sizes, clincher and quick-detachable beads only being carried. Both red and gray tubes are carried. Prices on casings are represented by those for the 36 x 4 size, which are \$31 for plain tread and \$36.80 for angle tread. In this size red tubes are priced at \$6.50 and gray tubes \$5.70.

Mussinan—Mussinan Tire Co., 2 West Forty-fifth St., New York—An original type of pneumatic tire which differs radically in the method of supporting the load is produced. On the theory that the orthodox type of tire places the point of support between two points of pressure, so that the load lines intersect the tread at a point where the latter is not in contact with the road, and that therefore the curved tread of the casing must act as a beam to support the weight of the car, the inventor of this tire has increased the points of support to two and moved them to coincide with the beads of the tire so that they are in the load lines, the space between being an arch. The effect is that of a dual tread

which is said to resist skidding. The two treads are secured by building up the casing at the sides. A shallow bead called a key arch is placed between the two tread beads and is joined by rubber arches to the tread beads. The latter are cut into sections. This leaves a number of suction cups, each alternate one of which has a vent. Mussinan tires are being made experimentally in 34 x 4 sizes, 37 x 5 tires to follow.

Double-Fabric — Double-Fabric Tire Co., Auburn, Ind.—This company features a new inner tube made of six plies of rubber, alternate layers of red and gray gum, which is said to combine the good features of both compounds with the faults of neither, and a new type of adjustable hook-on tire boot, as well as a varied line of rubber motor vehicle accessories. The new tube is called the Double Rubber tube, and is said to be 50 per cent thicker than standard tubes. The new boot has the hooks secured by small bolts. There are two sets of holes, permitting of three adjustments, while retaining the rapid-application feature of the hook fastening. A new line of vulcanizing supplies also has been developed. Besides a new outfit for owners, several new outfits for professional repairmen are included. One feature of these is fabric, packed in 5- and 10-pound packages, for use in small shops. The cloth is cut on the bias, so that no great space or elaborate preparation is necessary on the repairman's part, and expressage or parcel post on larger packs is saved.

Rutherford — Rutherford Rubber Co., Rutherford, N. J.—Sterling tires, tubes and supplies are produced with a number of new products and novel features. Features are made of a new serpentine-tread solid tire, a special line of Ford tires guaranteed for 5,000 miles, Ford tubes with a blue fabric armor on the inner periphery to protect them against pinching, and a new vacuum-bar tread on the regular pneumatics. This tread consists of a series of broad V-shaped projections, bound by circumferential bands. The new casings have dark brown treads and red side-walls. Another new product is a snap-on tread for old tires. This tread is designed to be cemented onto the worn-out tread of an otherwise good casing. The spur tread formerly introduced is continued by the Rutherford company.

Gordon—Gordon Rubber Co., Canton, O.—The feature of the Gordon line is the Gordon Triangle Tread casing. This is

a non-skid design with a triangle-shaped raised pattern, which is said to present surfaces facing three directions, and to distribute the strains over a large tread surface. These casings are made in straight-side quick-detachable and clincher shapes and in smooth treads. Both red and gray inner tubes are made. Gordon tires are guaranteed for 4,000 miles. Prices are \$30 for plain tread 36 x 4 casings, or \$33.50 for the non-skid pattern, with other sizes in proportion. The tubes for this size are \$6.44 for the gray compound and \$7.15 for the red gum type.

Voorhees—Voorhees Rubber Mfg. Co., Jersey City, N. J.—Red, gray and black inner tubes are made as well as rubber bumpers for springs, radiator hose cut to the proper length, lamp tubing and rubber fan belting.

Dixie and Dreadnaught—Rubber Tire & Accessories Co., 28 West Sixty-third St., New York—A new line of medium-grade tires with plain or non-skid treads optional at the same price, under the name of Dixie, as well as Dreadnaught tires, is made. Dixie tires are guaranteed for 3,500 miles, and have the standard gray tread. They are made in regular clincher, quick-detachable and straight-side types, and special red and gray inner tubes are carried in this line. Sample prices are \$25.95 for a 36 x 4 casing, \$5.75 for a red tube of the same size, and \$5.20 for a gray. Dreadnaught tires in these sizes are priced at \$37.05 for the round tread, \$42.65 for the vacuum tread, and \$8.45 for the red inner tube.

Greenburg tubes are made in four brands: Pyramid, a standard red tube; Red Wing, an extra heavy red tube; Silver Gray, a standard gray tube, and Isbest, a heavy red tube reinforced with endless cord cables imbedded in the rubber. For the 36 x 4 size, these different grades are priced, respectively, at \$6.50, \$8.35, \$5.90 and \$14.75.

Brown—Story & Reed, 1328 Broadway, New York—Brown puncture-proof inner tubes are marketed by Story & Reed. These tubes are claimed, when punctured, to be self-healing, owing to their peculiar construction. On the tread side, these tubes are reinforced with fabric. They are vulcanized approximately round and then, before the two ends are cemented together, are turned inside out, so that the rubber on the inside of the tread portion is under high compression. It is said that nails may enter the tubes, but that they will immediately heal themselves. The Brown tube is manufactured

by the Voorhees Rubber Mfg. Co. New prices on the Brown tube went into effect January 1; they are—30 x 3, \$8.75; former price, \$9.95. 30 x 3½, \$10; former price, \$11.65. 34 x 4, \$12.80; former price, \$15.40. 36 x 4½, \$15.60; former price, \$17.85.

TIRE ACCESSORIES

Allen—Allen Auto Specialties Co., New York—Tire covers of enameled duck are among Allen products. Prices, including inner tube bag, from \$3 to \$5, according to size; demountable rim type, \$3.50 to \$5.50; for spare wheels, all sizes, \$6. Of fabric leather, \$6 to \$7; pantasote, \$9 to \$10; leather, \$20. Tire holders are made of manganese bronze, malleable iron and steel, and tire locks of bronze or pressed steel in single, double and adjustable types. Single holders, \$8 in bronze; \$5 in steel; adjustable type for one or two tires, bronze, \$8.50; malleable iron, \$5.50; double type, non-adjustable, bronze, \$9.50; small malleable iron, \$6.50; extra heavy type for demountable rim tires, bronze, \$12; malleable iron, \$8; double holder for foredoor and gunboat bodies, bronze, \$9.50; malleable iron, \$6.50; tire locks, small size, pressed steel, without padlock, \$1; double, pressed steel without padlock, \$1.50; double, bronze with Yale lock, \$4; malleable iron, \$3. Larger and heavier types, bronze, \$8; malleable iron, \$6.

Horsey—The Horsey Mfg. Co., Cleveland—A full line of tire specialties is manufactured. No-cement patches, \$3.60 per dozen small boxes; \$7.20 large boxes. Stitched blow-out patches for 3-inch tire, \$6.30 per dozen; 3½-inch, \$8.40 per dozen; 4-inch, \$10.50 per dozen; 4½- and 5-inch, \$12.60 per dozen. Rim cut patches, \$5 to \$7.80 per dozen. No-cement, quilt-stitched, inner liners, \$4.50 to \$11.50 each, less 25 per cent. Double flap, blow-out patches, \$3.25 to \$6.50 per dozen. These are dealers' prices.

Gemco Lock and Tire Carriers—Garage Equipment Mfg. Co., Milwaukee—This company has a lock for Ford cars operating by a key which, when turned, forces a rod into contact with another, the two being so connected that their junction short circuits the magneto, preventing anyone starting the car without the key; it sells for \$1.50. The company also makes a full line of tire carriers for both side and rear mounting, license brackets, etc., the feature being the Gemco combination tail lamp, license bracket and tire holder for Fords, carrying one

or two tires. It is designed to mount at the rear, clamping on without requiring any drilling and in such a position that the exhaust gases are not thrown into contact with the spare tires. It sells for \$3.95 complete.

Miller—Charles E. Miller, Anderson, Ind.—This line includes vulcanizing cement, repair rubber, fabric, repair compounds, inside and outside blow-out boots, tire reliners in three-ply and four-ply types, and non-skid tread bands. Heavy inner blow-out patches with floating flaps 25 cents to 80 cents; hook-on boots, 75 cents to \$2; lock patches, 30 cents to \$1; adhesive four-ply tire reliner, which will cement itself in place without other cement, from \$1.95 to \$8.20; three-ply reliner, same construction, 40 and 5 per cent less than four-ply.

United States—United States Tire Co., New York—This line includes everything in the line of tire sundries and repair materials except valves and valve parts and pumps. One of the specialties is the never-creep tire sleeve, which is made with a fabric flap on each side to fit under the bead of the casing. Made in three sizes for casings from 2½ to 3 inches, 3½ to 4 inches, and 4½ to 5 inches, 8, 10 and 12 inches long, 55 cents, 65 cents and 90 cents; dealers, 35 cents, 45 cents and 65 cents. Outside tire sleeves of rubber and fabric with lacings, same sizes, all 8 inches long, \$1.20, \$1.25 and \$1.35; dealers, 52 cents, 65 cents and 75 cents. Vulcanizing outfits, acid cure, containing jug of acid vulcanizing solution, can of cement, emery cloth, brushes and instructions, 80 cents; with package of assorted patches, \$1.80; dealers, 42 cents and \$1.15.

Cohutta—Cohutta Talc Co., Dalton, Ga.—Talc, put up in one-pound sifter top packages, which sell to jobbers for 4 cents each and to retail dealers at 6 cents f. o. b. factory at Chatsworth, Ga.

Air-in-AI—Woodbridge Chemical Co., New York—Air-in-al, a puncture sealer which is designed to be injected into the tube without interfering with the air in the tube or affecting resiliency, is made. It fills about one-tenth the air space in the tire. It is claimed to be non-injurious and non-deteriorating. Two sizes, the smaller for 30 x 3 and under and the larger for larger tires are carried. In use, the can in which the material comes is connected with the air valve and the contents poured into the tube. The small-sized can costs \$1.00, and the large, \$1.25.

Grossman Ford Tire Holder—Emil Grossman Mfg. Co., Brooklyn, N. Y.—A tire holder for one or two tires combined with a rear license bracket and lamp attachment is manufactured. The device clamps over the rear spring, no drilling being required. It sells for \$3. A one-piece holder for either one or two tires for mounting on the Ford runningboard sells at \$2. The company has a complete line of tire holders for all cars, prices ranging from \$1.35 to \$3.35, holders being designed for mounting at either side or rear. A one-piece license bracket for Fords, selling at 20 cents, and a combination rear lamp and license bracket at 35 cents are also on display.

K-C—Western Rubber & Tire Co., Kansas City, Mo.—The product consists of outside boots, inside patches, reliners and repair and vulcanizing supplies. No-stretch boots are made of one layer of chrome leather and two layers of tire fabric vulcanized together. The hooks are adjustable three ways to fit every variation in the sizes of new tires and also to fit old and worn tires. Prices, 3-inch, \$1.35; 3½-, \$1.45; 4-, \$1.70; 4½-, \$1.90; 5-, \$2.10. Lengths, 7 to 9 inches. Extra long, 9 to 11 inches, \$1.85 to \$2.45. Steel studded, rubber lace-on and flat boots also are made. Reliners from 28 x 2½ to 36 x 5½. Prices, 30 x 3, \$3; 30 x 3½, \$3.50; 34 x 4, \$5; 36 x 4½, \$6. The tire rebuilder is a reliner of chrome leather cemented into the casing. It is of a single thickness and is treated with asbestos. Sizes, 28 x 2½ to 37 x 5. Prices, 30 x 3, \$5.25; 34 x 4, \$8; 36 x 4½, \$9.30.

Sampson—Stevens & Co., New York—This is an inner tube patch or plug which is used without cement or vulcanizing. It is of the screw type and is made in two parts or disks of metal based with soft rubber on the inside. In mending a puncture the hole is slightly enlarged, the plug inserted, and the two disks screwed up tight by means of the threaded stem, and the stem is then broken off short. The soft rubber spreads out and completely covers the surfaces adjoining the puncture. The repair is designed to be a permanent one. The Sampson repair kit includes a box of plugs of assorted sizes and a tool for spreading the puncture to permit insertion. No other tool is required. Price of kit complete, \$3; plugs, \$1.75 per dozen.

Endurance—Endurance Tire & Rubber Co., New Brunswick, N. J.—The product is red and gray tubes, tire and tube re-

pair stocks, cements, plain and cementless patches, valve bases and repair sections. Gray inner tubes, 30 x 3, \$2.80; 34 x 4, \$4.90; 36 x 4½, \$6.45. Red tubes, 30 x 3, \$3.80; 34 x 4, \$6.15; 36 x 4½, \$8.20.

Keystone—Keystone Rubber Mfg. Co., Erie, Pa.—A general line of tire supplies and accessories is manufactured. A specialty, however, is made of the Keystone no-cement patch, the feature of which is that though it is made of a single piece of rubber, one side is cured while the other is raw. The unvulcanized surface is protected by a piece of Holland cloth which is stripped off when the patch is to be used. Patches are put up in packages containing three sizes, together with emery paper and cleaning cloth. Price per package, \$1.

Woodworth—Leather Tire Goods Co., Niagara Falls, N. Y.—This line consists of treads, chains, boots and inner sleeves. A recent product is the ventilated tread, made both with and without steel studs. Construction is practically the same as the standard Woodworth tread. The band is connected with spring rings on each side by narrow galvanized steel plates about 2 inches apart, making a strong fastening and at the same time permitting the air to reach the tire. All Woodworth treads are made in all regular tire sizes from 30 x 3 to 40 x 5½. Ventilated rubber tread, 30 x 3, \$8; steel studded tread, \$9; full studded leather tread, \$9.90; 32 x 4, \$13.90, \$15.50 and \$17.05; 34 x 4, \$15, \$16.50 and \$18.15; 36 x 4½, \$19.75, \$22 and \$24.20. Easyon tire chains are single chains fastened to the spokes with leather fastenings having snaps to take the ends of the cross chains. A set consists of eight, four for each rear wheel, and two sizes are made, fitting all tires from 3 to 5 inches. Prices, small size, \$3.20 per set; large size, \$4; dealers on treads, 20 per cent; on chains, 25 per cent.

Atlas—Atlas Rubber Co., Chicago—Product consists of reliners, which are made in all regular sizes from 3 to 5½ inches and of any length. Made in 16-ounce Sea Island fabric with friction rubber between the layers, and is self vulcanizing. Each reliner is packed in a paper box and the vulcanizing cement is protected by a wrapping of wax paper. Prices, 3-inch, \$3; 3½-inch, \$4; 4-inch, \$5; 4½-inch, \$6; 5-inch, \$7; 5½-inch, \$8.

Titewad—Page-Lester Co., Chicago—This is a special patch material which requires no vulcanizing. It is used to

repair punctures, cuts, blisters and other tire injuries, the rubber being cleaned with gasoline, cemented and Titewad filled in and pressed down. It is allowed to dry and no further treatment is required. It is furnished in packages of two sizes, \$1 each or \$8.10 per dozen, and 75 cents each, \$6 per dozen.

C. O. T.—C. O. Tingley Co., Rahway, N. J.—Hook-on boots, lace-on boots, blow-out patches, cement and cementless patches and other tire supplies constitute the line. Hook-on boots, 90 cents to \$1.30; lace-on boots, 75 cents to \$1; blow-out patches of six-ply duck, 50 cents to 90 cents. Ford special blow-out patches, 35 cents to 70 cents. Self-vulcanizing tire cement for mending cuts, dig-outs, blisters and tears, \$1 per can.

Wonder Worker—The Hall-Thompson Co., Hartford, Conn.—The line includes liquid rubber paint, rim paint, mica tire powder, French talc and repair compounds and patches. Rubber paint, 50 cents per can; dealers, \$4 per dozen. Rim paint, 75 cents per pint; dealers, \$6 per dozen pints. Mica tire powder, tubes 25 cents; dealers, \$1.50 per dozen, and 3-pound packages 75 cents; dealers, \$6 per dozen. French talc, 15 cents per tube; dealers, 90 cents per dozen; 5-pound package, 50 cents; dealers, \$3 per dozen packages. Para Plastic outfits, 75 cents; dealers, \$6 per dozen; Para Plastic 2-ounce cans, 40 cents; dealers, \$2.75 per dozen cans. Vulcanizing cement, 60 cents per pint; dealers, \$4.50 per dozen. Cementless patches, 50 cents and 75 cents per box of 10; dealers, \$3.60 and \$4.80 per dozen boxes.

Stoddard Rubber & Tire Co., New York—Product consists of tread stocks, tube gums, fabrics, cement and lithophone. Tread stock is put up in standard widths 1/16-inch thick, in 1-, 10-, 25- and 50-pound packages; prices from 70 cents to \$1 per pound, either light or dark. Retreading stock, 60 to 90 cents per pound, light or dark. All stock is furnished also in camelback in 25- or 50-pound lots. Cushion and tube gum, 90 cents per pound; 75 cents per ½ pound. Red tube gum, 95 cents to \$1.10 per pound. Fabric, 70 cents to \$1 per pound. Vulcanizing cement, \$1.60 to \$1.80 per gallon. Lithophone solution for painting inside of tire white, \$1.50 per gallon. Dealers, 10 per cent to 10 and 5 per cent, according to quantity.

North Carolina Talc & Mining Co., Hewitts, N. C.—Tire talc is produced and is marketed in 220-pound bags and sold

to the trade. The price varies from \$10 to \$30 per ton, according to quantity and quality.

Gilbert—Gilbert Mfg. Co., New Haven, Conn.—Tire covers, sleeves, brackets and tube cases are manufactured in all sizes. Cases are made to fit various makes of tires, and are fastened with snap buttons. Prices, in black enamel duck, are from \$3.50 to \$4.50; fabric leather, any color, \$4.50 to \$5.50; mohair, \$7.50 to \$10; black patent leather, \$12 to \$15; grain leather, \$12 to \$15. A low-priced cover, made in black enamel drill, from \$2.50 to \$3.50. Wire wheel cover, for tire and rim only, any size, black enamel, duck, \$3; cover to protect the entire wheel, black enamel duck, \$5 to \$6; in artificial leather, \$7 and \$8. Tube bags, from 50 cents to \$1; tube cases, 60 cents to \$1.50. Dealers, 33⅓ per cent.

Continental—Continental Rubber Wks., Erie, Pa.—This line includes inner tube patches, cementless patches, self-vulcanizing patches, liners, tire plasters, repair sleeves, blowout patches, friction fabric, patching rubber and other repair material. A new product is the Vitalic casing in Ford sizes, 30 x 3 and 30 x 3½. This has the special Vitalic non-skid tread. Genuine Egyptian fabric is used with pure rubber friction; the cushion stock also is of pure rubber and comes down to the bead. Tread stock is of high grade rubber, compounded for toughness, resiliency and endurance. In the 30 x 3 there are four plies of fabric and in the 30 x 3½ five plies. While non-skid treads are regular, plain treads will be furnished also.

Acme—Acme Supply Co., Ionia, Mich.—Product consists of air tube splicers, rubber cement and timers. The timer consists of a special clock with a row of circular buttons around the rim. When vulcanizing tires the button is pressed opposite the time at which the vulcanizing will be finished; at that time the alarm rings. The idea is to automatically time the work and eliminate clock watching. Price, \$7.50 each. Splicers, \$15 per set of four, different sizes. Discount, 25 per cent.

Goodrich—B. F. Goodrich Co., Akron—A complete line of tire repair materials is manufactured. An assortment of supplies is put up in a special display case, including rubber cement, tubes, patches, plugs, tire tools, rubber bumpers, tire repair gum and fabric and many other articles, the total retail value being \$95.54. The outfit sells to the dealer for

\$51.20. When the case has been emptied it can be replenished, as it forms a permanent store fixture.

North Western Chemical Co., Marietta, O.—Rim paint, tire dressing, tire mica and tire talc are among this company's products. The rim paint is used to prevent tires from sticking to rims and to prevent rust; price, per can, 50 cents; tire-lac is a rubber paint for use on tires and is made in white and gray; price per can, 60 cents. Tire mica is finely ground, American mica for lubricating inner tubes; price per can, 20 cents. Slip-easy tire talc is 15 cents per can.

Lee—Lee Tire & Rubber Co., Conshohocken, Pa.—Product includes patches for various shapes, valve patches, valve and valve parts, fabric reliners, splicing sleeves, retreading and repair materials, inner tube stock, cements and solutions. These are sold to dealers only. Double-quick cementless patches, round, can of 10 assorted sizes, 35 cents; box of 12 cans, \$4. Oval, 50 cents and \$5.25. Valve patches, red, large, \$11 per 100; small, \$6.50. Gray, large, \$8.50; small, \$5.50. Inner tube patches, box of 12 assorted, 30 cents; 12 boxes, \$3.15. Fabric reliners made in all sizes from 28 x 3 to 38 x 5½; 30 x 3, \$1.55 each; 34 x 4, \$2.55; 36 x 4½, \$2.90.

Falls—Falls Rubber Co., Cuyahoga Falls, O.—Patches, sleeves and patching material are manufactured. Rim-cut patches fit inside the casing with fabric edge cured in shape to fit around bead; heavily reinforced to prevent blowout along rim. For tires from 2½ to 5 inches, prices, 75 cents, \$1 and \$1.25. Self-vulcanizing rim-cut or blow-out patches are flat, not cured, so there is one side of friction fabric to adhere to the inside of the casing while the tube side is soft. Prices, 45 cents to \$1.10. Self-vulcanizing blow-out patches made in one size for any tire, 30 cents each. Rubber and fabric tire sleeve with eyelets and lacing, \$1.20 to \$1.50. Self-vulcanizing inner tube patches, per box of ten, 90 cents. Self-vulcanizing patching material, ½-pound rolls, \$2.35; 1-pound roll, \$4.50.

Bryant—Stevens & Co., 375 Broadway, New York—The plunger and lever of this tool are connected by toggle joint, which gives great leverage. The yoke is extended on the lever side to carry the pivot to the toggle member. On the opposite side of the yoke is an adjusting screw terminating in a pad; this permits the tool to be adjusted for tires

of any size. The yoke may be placed over the tire or under the rim. Price, \$2; dealers, \$1.40.

Jewel—Wadsworth-Howland Co., Chicago—Tire dressing, soapstone and rim coating are produced. The tire dressing is made in white and gray and is designed to improve the appearance of tires and assist in their preservation. Put up in cans containing 1/10, ¼, ½ and 1 gallon; price, smallest size, in case of six dozen, \$2.10 per dozen; retail price, 35 cents per can; ½-gallon cans, \$13.20 per dozen; retail, \$2.20 each. Soapstone or tire talc is put up in sifter top packages in two sizes, No. 1, 72 cents per dozen; retail price, 12 cents each; No. 2, 54 cents per dozen; retail price, 9 cents each; 5-pound paper packages, \$2.16 per dozen; retail, 36 cents each. Rim coating, in cans, ½-gallon, \$13.20 per dozen; retail, \$2.20 each; 1/10-gallon cans, \$2.10 per dozen; 35 cents each.

Interlock—Double Fabric Tire Co., Auburn, Ind.—The product consists of inner tubes, reliners, outside boots, inside patches and other tire accessories. Double rubber tubes are made of multiple plies of alternate red and gray rubber in all sizes; prices, \$3.45 to \$14.30. Interlocks are fabric linings placed between the tube and the shoe to reinforce weak tires. It is essentially a very light tire made to fit inside the regular tire, and is made endless and of exactly the right size to fit each tire. The outer surface is of gray rubber. The lateral edges form double flaps which become automatically locked under pressure, the object being to leave no weak spot. All sizes are made and the prices range from \$4.50 for 28 x 3; \$7.40 for 30 x 4; \$8.45 for 34 x 4, and \$11.35 for 36 x 4½ up to \$16.10 for 40 x 5½.

Utility—Poughkeepsie Utilities Corp., Poughkeepsie, N. Y.—Tire talk made without chalk and containing no grits. It is put up in tubes and is packed 24 tubes to the case; dealers' discount, 33½ per cent.

Twentieth Century—Twentieth Century Tire Protector Co., Midlothian, Tex.—This line consists of inside and outside emergency patches which are made in all sizes, with and without studded tread. A new product is the Perfect-Lock inside patch. The feature of the patch is a locking device at the bottom which holds the patch together so that it slightly squeezes the tube, preventing its bulging opposite the damaged point in the casing. The patch is

made from 4 to 6 plies of fabric, and has a continuous hinge of leather at the bottom. The prices range from \$1 for the 3-inch to \$2 for the 5-inch; all are 10 inches long; discount to dealers is 40 per cent.

Jiffy—R. & B. Mfg. Co., 5525 Woodland avenue, Philadelphia—Tire tool of yoke-and-plunger type, the yoke passing under the rim and the plunger operated by pulling a lever upward, forcing the tire and ring inward. This clears the locking ring, which is lifted out by a lift on a second lever pivoted above the first and swinging at right angles to it. The lifting lever can also be used for taking off valve stem nuts and for throwing clincher tires. The price is \$3.50 and the tool can be conveniently used with any tire.

Polo—Polo Tire Alarm Co., Chicago—This device has been brought out in an improved form in which both tire alarm and valve are incorporated; it takes the place of both valve and dust cap. In its standard form the alarm is made in three models, one set for 30 pounds minimum and designed for Fords; one set for 40 pounds, for average cars, and one set for 70 pounds, for heavier cars. Price is \$1.50 each in any size. They can be adjusted for any pressure between 30 to 150 pounds; a charge of 25 cents per set of four is made for special adjustments to pressures other than those specified.

CLOCKS

Phinney - Walker — Phinney - Walker Keyless Clock Co., New York—This company, which manufactures keyless clocks exclusively, has taken on the New Haven Clock Co.'s entire line of key clocks.

The Phinney-Walker clocks have rim wind and rim set and are made in 7 models; both flush and offset mountings are furnished. Prices range from \$8 to \$9.50; dealers, \$4.50 to \$5.00. The New Haven clocks are made in both 1- and 8-day movements. Among the 1-day clocks is the Uncle Dudley, which is a tilted dashboard clock with 2¼-inch face, cast brass case and nickel or black and nickel finish, price \$3.50; dealers, \$1.75; Panama, flush type, 2¼-inch dial, 3-inch base, \$3; dealers, \$1.50. Among the 8-day clocks are the Jericho with round barrel, offset, 3-inch porcelain dial, \$7; dealers, \$3.50; cowl, flush type, projecting only ¾ inch from dash, \$8.50; dealers, \$4.25.

Miscellaneous

Chas. E. Miller, New York—Atco trunks, lunch kits, etc., of all descriptions, styles and colors, and ranging in price from \$13 to \$36, a feature being the all-veneer revolving door tire trunk, which is made in sizes from 21 to 26 inches in diameter, being 9 inches deep. A full line of Waterbury automobile clocks is also carried in all styles and finishes and varying in price from \$5 to \$9. The Three-in-One Ford combination bracket consists of crank-handle holder, adjustable license pad holder and lock, the latter feature being an insurance against theft. The license pad holder is designed to accommodate any size plate and the whole device is very simple to apply. Without the padlock it sells for \$1 and with the lock for \$1.25. A front axle bracket for the license plate at 50 cents and an adjustable lamp iron bracket of crucible steel, black enamelled, selling for the same price, are other features of the line. Gilbert tire cases are sold in all sizes, prices varying with the material and sizes from \$3.50 for black enamel duck, 28 to 36 inches; \$4.50 for the same size in fabric leather; \$7.50 for mohair and \$8 for Pantasote, to \$10 for Pantasote in sizes of 43 inches or over. All prices include inner tube bag. Special materials may be had at additional expense. Demountable types are 50 cents extra, as are also special colors. Gilbert inner tube bags are made in all sizes and styles in fleece-lined rubber cloth, brown duck, check back rubber cloth and rubber muslin, prices being 50 cents for the last two, 75 for the brown duck and \$1 for the fleece lined.

A full line of Globe steel tool and battery boxes for Fords and all other makes of cars is also carried, the sizes running from 9 $\frac{3}{8}$ inches long, 7 $\frac{5}{8}$ wide and 12 high at \$3.25, to 28 $\frac{3}{8}$ by 10 $\frac{3}{8}$ by 10 $\frac{5}{8}$ inches at \$7. There are any number of combinations, standard finish being black enamel with Yale lock, which may be had in black nickel, lacquered brass or nickel plate. Wood linings and aluminum mats are optional at additional expense, the former costing from \$1 to \$2 extra and the latter from \$1.25 to \$2.75.

Hoosier—Hoosier Coil Co., South Bend, Ind.—Double vibrator coil for Ford cars. This master vibrator is peculiar in that it has two complete vibrators with a single coil, so that the sticking of one vibrator cannot stall the car, as the second will automatically take up the work and keep the motor running.

All the points are of heavy platinum. The coil is housed in a polished mahogany box and has a substantial switch with a locking plug; the switch has the usual battery, magneto and off positions. Price, \$15.

Raybestos—The Royal Equipment Co., Bridgeport, Conn.—In addition to Raybestos brake lining, Stability lining is produced; also a cotton brake lining for the Ford company. Raybestos is solid woven fabric throughout and is impregnated after weaving with a special compound. Stability lining is an all cotton fabric of high-grade yarn which is treated with a compound which resists heat and wear. The Ford cotton lining is also impregnated. A special combination asbestos and cotton lining is made especially for Ford cars, is impregnated and contains no wire. Raybestos is made in widths from $\frac{1}{2}$ inch to 8 inches and can be supplied in practically any width on special orders. Raybestos is made in four thicknesses, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$ and $\frac{1}{4}$ inch. Price per foot, $\frac{1}{8}$ inches wide, 40, 48, 58 and 76 cents; 2 inches wide, 52, 64, 76 cents and \$1. Stability lining is in two thicknesses, $\frac{5}{32}$ and $\frac{1}{4}$ inch; price, $\frac{1}{4}$ -inch width, 16 and 24 cents per foot; 2-inch width, 20 and 30 cents. The company makes a specialty of complete brake equipments, the bands being lined with their friction fabrics. Duplex and Raymond brakes are supplied in all sizes. Dealers' discount on Raybestos is 50 per cent; 100-foot rolls of a size, 60 per cent; lot of 300 feet of assorted sizes, 60 per cent. Special combination cotton and asbestos lining for Fords, 39 cents per foot to jobbers.

Sparton—Sparks-Withington Co., Jackson, Mich.—The latest model, the J-F, is an electric motor-driven horn, 11 inches over all, with $\frac{5}{4}$ -inch round beaded bell and black satin finish. Price, \$8. A flare bell is found on the \$9 model. A larger horn with straight projector costs \$14, and with oval bell, \$15. Sparton hand horns were described in the December 23 issue of Motor World.

Warm Hand Steering Wheel—Warm Hand Steering Wheel Corp., Poughkeepsie, N. Y.—A line of wheels fitted with electrically-warmed grips for all makes of cars. In the grip tubing, which is of the same diameter as the rest of the wheel rim, is a heavily-insulated wire, one end of which runs to the current

source while the other is grounded on one of the spider arms. The necessary current may be obtained from a storage battery lighting generator or Ford magneto. The wheel is installed on a Ford or any other machine where the rim is screwed onto the spider by simply removing the four screws holding the old rim and putting on the new. On cars where the rim is integral with the spokes the whole rim is furnished. Prices vary, ranging from \$10 on a Ford and \$12 on a Studebaker or Overland to \$30 on a large car.

Safety Steersman—Racine Auto Specialty Sales Co., Chicago—This is a device for preventing lost motion and backlash in Ford steering gears and rendering easier the steering of the car. It is attached by lining up the wheels and clamping one arm to the Ford spindle arm and the other arm on the spindle connecting rod. Price per set, \$8. Another product is a chain tool for drawing a broken chain together for repair; it is screw operated. Price, large size, \$1.25; small size, \$1.

Asch Luggage and Tire Carriers—Asch & Co., Inc., New York—A suit case or package carrier made by the L. P. Halladay Co., Streator, Ill., and distributed by Asch & Co., consists of two iron angles which clamp on the running-board and secure the luggage by means of straps passing around it. It will hold two suit cases and is adjustable to slide to any width. The two irons and the straps occupy little space and can be carried in the tool box or any other compartment. In black japan finish they sell for \$3. A rear tire holder for Fords is also carried by the Asch company. It is light, simple and easily attached and takes either one or two tires. In black japan and complete with straps they sell for \$3, being suitable for either roadster or touring car use.

Superheater—R. O. C. Sales Co., New York—This is a device for heating gasoline just before it enters the carbureter and consists of an exhaust jacketed chamber which is connected in the gasoline line. The carbon deposits can be removed easily by taking off the cover which exposes the jacket interior. A single size only is made. Price, with flexible tubing and connections, \$3.50. Dealers, 12 or more, 33 $\frac{1}{3}$ per cent.

Bausch Machine Tool Co., Springfield, Mass.—The efficiency machine is designed to show at a glance the loss of power in a worm drive. The gear to be tested

is driven by an electric motor, the fields of which are mounted on ball bearing trunnions, and the armature is connected to the worm shaft, which carries a drum for a Prony brake. The torque reaction on the fields is measured by a spring balance, connection being through a 9-inch arm. The Prony brake is connected to another spring balance. One balance shows the total pressure of the motor while the other shows the pressure minus the loss through the worm. The machine is designed for exhibition purposes to show the efficiency of the Hindley worm type made by this company.

No-Shammy — No-Shammy Products Co., Cleveland—Products include rectangular funnels with fine brass-wire gauze, $5\frac{1}{2} \times 12 \times 9\frac{1}{2}$, \$3; $3\frac{1}{4} \times 9 \times 6\frac{1}{2}$, \$2; $1\frac{3}{4} \times 4\frac{3}{4} \times 2\frac{1}{2}$, \$1; round funnels, $9 \times 4\frac{1}{2} \times 11\frac{1}{2}$, \$3; flat side round, $12\frac{1}{2} \times 14\frac{1}{2}$, \$2.50; $9 \times 11\frac{1}{2}$, \$1.50; two-compartment waste cans to hang on wall, $14 \times 8 \times 10$, \$2; $20 \times 10 \times 18$, \$3; round waste cans, 12×18 , \$1.60; $13 \times 18\frac{1}{2}$, \$2.75; 15×22 , \$4.50; 24×38 , \$12.50. Other products are a Utility box of metal with four compartments, one for shellac, one for graphite, one for white lead, and one for grease, dimensions $8 \times 12 \times 4$, finished black japan, \$2, including 1 pound white lead, 5 ounces shellac, 5 ounces oil and graphite; without these, \$1.50; half and half oil measure, which is both measure and funnel with a thumb-operated valve for releasing the oil, $7 \times 3 \times 8$, \$1; $7\frac{1}{2} \times 3\frac{1}{2} \times 9\frac{1}{2}$, \$1.25; $6 \times 3 \times 12$, \$1.50; drip pans, 35×47 , \$3; Ford size, 29×41 , \$4; extension spouts for round funnels, 12-inch offset, 50 cents; 18-inch offset, 75 cents.

Hartford—Hartford Suspension Co., Jersey City, N. J.—This device is designed for use on Ford cars and is a heater for the fuel. A hollow flange is inserted between the carbureter and the intake pipe and the air which passes through it is heated by traversing a heater on the exhaust manifold. The hot air passes into the pipe through radial openings, mixing with the fuel, breaking up the particles and assisting vaporization by heat. The screen in the flange helps in breaking up the larger particles. Price, \$10; dealers, 20 per cent.

Carborundum—The Carborundum Co., Niagara Falls, N. Y.—Valve grinding outfits are put up in boxes containing two tubes, one of fine and the other of coarse paste, Carborundum cloth strips for cleaning contact points and book of Carborundum cloth for general purposes; price, 75 cents. Paste put up in separate

tubes, 25 cents each. Paste in 1-pound cans, 50 cents each; 3-pound pails, \$1.25 each; 5-pound pails, \$2 each. A new combination can has been brought out containing both fine and coarse compound, at 25 cents.

Gryndyn—Stewart & Co., New York—This compound is put up in a new package, a 4-oz. duplex screw cover tin box, containing coarse and fine grades. Price, 40 cents. Also put up in 1-pound friction top tin cans at \$1 per pound, any grade. Dealers and garages, 4-oz. cans, \$3.25 per dozen; 1-pound cans, 75 cents each.

Chemically Correct — Northwestern Chemical Co., Marietta, O.—Valve grinding compounds are put up in sets. Three tube set consists of one 2-oz. tube of fine, one 2-oz. tube of medium and one 2-oz. tube of coarse compound, all packed in a tin carrying case. This is intended for owners and is to be carried in the tool box; price, 40 cents. Double end box with 2 ounces of coarse and 2 ounces of fine compound, also for owners, 25 cents. The compound is also put up in single tubes of 2 ounces; price, 15 cents per tube, any grade. One-pound cans, 50 cents per pound, any grade.

Clover—Clover Mfg. Co., Norwalk, Conn.—Two forms of grinding compound are manufactured, one for individuals and the other for shop use. The individual type is put up in a 4-oz. duplex can containing two grades, one for roughing and one for finishing. Price, 40 cents. For shop use six grades are made, ranging from 1A, which is very fine, to E, which is very coarse. These are put up in 1-pound cans at \$1.25 per pound. Garages and car dealers, 25 per cent; supply dealers, 40 per cent.

Norton—Norton Co., Worcester, Mass.—The abrasive material used in this compound is a hard, sharp electric furnace product and is put up in three grades, coarse, medium and fine; the coarse is used only for very large valves with uneven surfaces and where a high finish is not essential. The medium grit is used chiefly for general tool work or for valves of brass, composition or soft metal where gas-tight joints and high finish are required. The prices, 2-oz. tube, 25 cents; 4-oz. tube, 35 cents; 1-pound can, 50 cents; 2-pound can, \$1; 5-pound can, \$2; dealers, $33\frac{1}{4}$ per cent.

Scott—Scott & Sons Co., Medford, Mass.—This has two needle valves, one operating at low speed and both at high speed. Both open into the main air pas-

sage; the low speed valve has a permanent adjustment operated from the exterior, and the high-speed needle is attached to a moving piston, so that the fuel feed increases in proportion to the piston opening. The high-speed needle passes through the nozzle and has a long taper, but is full seated only when the air valve is all the way down; this needle also has an exterior adjustment. The float chamber is offset and the butterfly throttle is at the top of the mixing chamber. No springs are employed. It is made in sizes from 1 to 2 inches. Prices, 1-inch, \$25; $1\frac{1}{4}$ -, \$30; $1\frac{1}{2}$ -, \$35; $1\frac{3}{4}$ -, \$40, and 2-, \$55. All models are supplied with hot air connections and strangling device with dash operating attachment. Dealers, 60 and 10 per cent.

Warner Sleeping Blanket — Perkins-Campbell Co., Cincinnati, O.—The Warner blanket and lap robe is made of the best fabric and very warm. It sells for \$16; dealers, 50%. Other articles sold by the company are leather crank holders for all cars, the Ford type listing at 20 cents, and Latigo fan belts at 50 cents.

Akron-Williams—Williams Foundry & Mfg. Co., Akron, O.—A wide range of shop vulcanizing equipment is manufactured for casing and tube work of all kinds. The standard three-cavity casing repair vulcanizer is designed to be used in connection with a separate steam generator. It has sections for tires from $2\frac{1}{2}$ to 5 inches; length, about 18 inches, measured on the tread; price, with steam gauge, three pairs steel clincher head moulds, \$95. Inner tube vulcanizer, 8×20 , three pressure bars, \$22; 8×36 , six bars, \$32; 8×52 , nine bars, \$40. Steam generating repair equipment with gas or gasoline burner, three pressure bars for tube work and three blocks and cores for casing work, \$40. Larger equipment is made for both tube and casing work.

The Clucker-Hixson Co., New York—To permit the escape of heated air from the bonnets of Ford cars and so facilitate the cooling of the motor, this device is installed over a series of holes cut in a sheet metal. The ventilator is so made that water cannot get in, there being a protecting hood over the air outlet. They are furnished in pairs complete with bolts at \$3.50.

Cuno—Cuno Engineering Corp., Meriden, Conn.—This timer is of the roller type, a hardened steel roller turning on a hardened steel bushing carried in a U-shaped holder which slides radially in

a steel arm. The flat steel spring presses the roller outward against steel contacts which are flush with the surface of the fiber ring. The ring is of the special hard gray fiber which is seasoned before machining, and the contacts are ground after assembling. The shaft turns on ball bearings. The cover is waterproof. Cable connections are of the quick-acting spring type. Prices: one-cylinder, \$2.50; two-cylinder, \$2.70; three-cylinder, \$2.90; four-cylinder, \$3.10; six-cylinder, \$3.50. A special model for Ford cars embodies the same features as the others; price, \$2.

Stewart—Stewart-Warner Speedometer Corp., Chicago—The vacuum feed system is continued unchanged. A small tank on the dashboard is connected by a pipe to the intake manifold and the suction draws gasoline from the fuel tank to the dashboard apparatus, whence it is fed to the carbureter. The flow is controlled by automatic valves. Price, \$10 complete with all connections.

Invisible—Simplex Mfg. Co., 1507 Great Northern Bldg., Chicago—This is a pedal-operated starter for Ford cars and attaches at the forward end of the crankshaft. Through a series of levers the pedal rotates the crankshaft and is spring returned. The leverage is such that the minimum of effort is required and the starter can be installed without machine work. Price, \$27.50.

B-T-K—B-T-K Gear & Engine Co., Muncie, Ind.—Cone clutches are made with and without springs under the leather facing, and another style with cork inserts. Disk clutches are made in a number of types; one has a center spring, six driving and six driven disks faced with Raybestos. A plate clutch has a single plate and two Raybestos disks, and toggle levers multiplying the pressure eight times. This is suitable for motors from 20 to 35 horsepower. Another clutch has two driven plates and one driving plate, the driven plates being faced with Raybestos; the capacity is 20 to 30 horsepower.

Essex Rubber Co., Inc., Trenton, N. J.—An asbestos sheet gas engine packing is manufactured which consists of asbestos fiber, through each thread of which runs a fine brass wire to give strength and prevent blowing out. The fabric is impregnated with a rubber compound. One side of the sheet is finished black and the other red. Other products are sheet rubber packing, both black and red; compressed asbestos packing

and many other varieties of packing and gasket material.

American—American Roller Bearing Co., Pittsburgh, Pa.—Bearings are made for every part of the car except the motor; they are interchangeable with most ball and roller bearings, there being a short series as well as a long series. The outstanding feature is that no lubrication is required, the bearings being constructed to run continuously without grease or oil.

Salisbury—Salisbury Wheel & Mfg. Co., Jamestown, N. Y.—The chief improvement made consists in the use of spiral gears which are supplied upon order in axles of pressed steel construction. Brakes have been made more efficient and machining and assembling have been improved. In axles of malleable iron housing straight bevel gears are used.

Detachable Upholstery—Perkins-Campbell Co., Cincinnati—This line consists of seat covers which differ from the ordinary kind in that they are fitted with unusual care and are of unusually good material, being waterproof, dustproof and durable. Stock covers are made to fit all standard cars. Another specialty is the Warner hooded waterproof sleeping blanket and lap robe; it is made with heavy blanket lining and waterproof duck outer cover and is used as a lap robe in the ordinary way. For a sleeping blanket one corner is so arranged that it can be made into a hood to cover the head while the rest of the robe wraps around the body. Price, \$16. Quick-acting tops, clutch throw-outs, muffler cut-outs, foot accelerators and windshield ventilators for Fords are also made. Percama is a cleaning compound for heavy fabrics, such as tops, seat covers and upholstery. It is put up in quarts, half-gallons and gallons at 25, 40 and 60 cents.

Brunton—Brunton Specialty Co., Cincinnati—This device is a tire grip, made in separate units, of which as many as desired may be used. Each unit consists of a tread plate of case-hardened drop-forged steel with corrugated face and hinged fastenings at each side for a strap which passes around the rim of the wheel and is given a turn about a spoke to hold the plate in place. The under side of the plate is smooth and the edges beveled. Straps are of chrome leather. Tread plates can be renewed when worn. Made in three sizes, 3½-inch, 90 cents each, and 4½- and 5½-inch, \$1 each.

Safety First—Noera Mfg. Co., Westbury, Conn.—An oil can is made of the squirt type, having a double bottom in which is a brass valve which permits oil to flow into the space between the bottom. Pressure applied in the usual way closes the valve and forces the oil in the bottom space out through the spout; the oil can be ejected regardless of the position of the can. Made in 10 sizes, from 3 ounces to 1 pint. Prices per dozen, 3-ounce, \$4.50; 5-ounce, 3-, 5- or 9-inch nozzle, \$5.50, \$6 and \$6.50; ½-pint, \$7.50, \$8 and \$8.50; 1-pint, \$9.25, \$9.75 and \$10.50. Oilers are of sheet steel. Standard spring bottom oilers are made also and in the same sizes.

Bucket—Whiteall-Tatum Co., New York—This company has brought out a bucket which is made of red rubber, cloth lined. It holds 1½ gallons and is reinforced to stand heavy strains by means of double corners and strong handles, which will not pull out. The price is \$1.25. The ordinary dealers' discount is 25 per cent and discount to jobbers and dealers buying three dozen at a time is 25 and 25.

M. and S.—Brown-Lipe-Chapin Co., Syracuse, N. Y.—This differential is of the spiral type and all gears are cut at an angle of 45 degrees. Six spiral pinions are journaled in the differential housing and mesh with corresponding gears on the axle shafts. The advantage of this type of differential is that if one of the driven wheels is on slippery ground it will not spin but permits power to be applied to the other wheel to drive the car forward. Preparations are being made to build this differential to fit all standard rear axles.

Utility—Morgan Mfg. Co., Newport, R. I.—This valve lifter consists of a pair of forks, one of which is attached rigidly to the end of a threaded rod, while the other may be moved up and down the rod by means of a nut. The nut is operated by a ratchet and handle. Price, plain finish, \$2; nickel plated, \$2.25; dealers, 50 per cent.

Globe—Globe Machine & Stamping Co., Cleveland, O.—All sizes, styles and shapes of steel boxes are manufactured, the sizes varying from 9½ x 7½ x 12 inches, weighing 9½ pounds, at \$3.80, to the trunk box 30½ x 14½ x 16¾ inches and weighing 36 pounds, at \$12. The boxes are made for all makes of cars, some special sizes being provided for Ford owners' use and some for trucks. They are designed for carrying batteries,

tools, etc., on the runningboard and other parts of the car. Combination styles, containing a compartment for the various sizes of acetylene gas tanks are listed at \$5 and \$10, the \$5 size being simply for the tank while the other also has tool trays. These are made for mounting on either the right or left runningboard. Additional charge of \$1 to \$2 is made for wood linings for any of the boxes, while aluminum mats cost \$1.25 to \$2.75 extra. A trunk for holding two suitcases and attaching to the runningboard by a tee bolt at each end is listed for \$12, while a refrigerator designed for tourists' use and containing one inner compartment for ice, one for food and racks for pint bottles sells for \$20 and \$25, according to size. The company also makes an underslung battery box for attaching to the floor of the car under the seat, and a tool tray, gas tank covers, locks for boxes, etc.

Radium—Milwaukee Auto Specialty Co., Milwaukee, Wis.—This is a scissors type which can be used for either contracting or expanding uses, holding either the spring or valve in place, as desired, and leaving the workman with both hands free to work as needed. The tool is nearly Y-shaped, with the arms hinged at one end. A slot runs lengthwise in each arm and a connecting piece extends from arm to arm through the slots. This arm can be moved in or out by wing nut and as it moves forces open

or closes the jaws or arms. The jaws are made of malleable iron. Price, \$1; dealers discount, 33⅓ and 10, less 5 for cash in ten days.

Nurinkle—R. E. Stevenson, Muncie, Ind.—This is a gasoline burning tool with steam chamber which is designed to be used on the tire while on the wheel. A safety valve on top of the water space prevents the accumulation of a dangerous pressure. A specially-shaped plate is provided for tube work. Price of the outfit, including vulcanizer, clamps, tube plate, scissors, measuring cup and repair gum is \$5.

Notch and Merryweather Machinery Co., Cleveland—This is a motor manufacturers' machine and is power driven; it is designed for grinding the valves of new motors and has a table for carrying the cylinders. The spindle is oscillated by means of a rack and pinion, giving a motion similar to that of hand grinding but much more rapid. The operator feeds the abrasive material and applies pressure through a hand lever. Equipment consists of one steel driver and a countershaft. Weight, 150 pounds; price, \$135.

American—American Valve Tool Co., Stamford, Conn.—This is a garage tool, designed to be fastened to the bench and is for refacing valves. Four different size pilot stems are supplied to fit the principal size valve stems. The tool

is made in two sizes for all valves from motorcycle size to the largest. Either size is easily adjustable. A seating tool also is made for reseating the cylinder faces. This is hand-operated, has four cutters and is readily adjustable. Two sizes are made, small and large, and 30-, 45-, 60- and 90-degree cutters can be supplied. Price, either size, \$6. Price of valve refacer, \$6. Complete set of three tools, \$15.

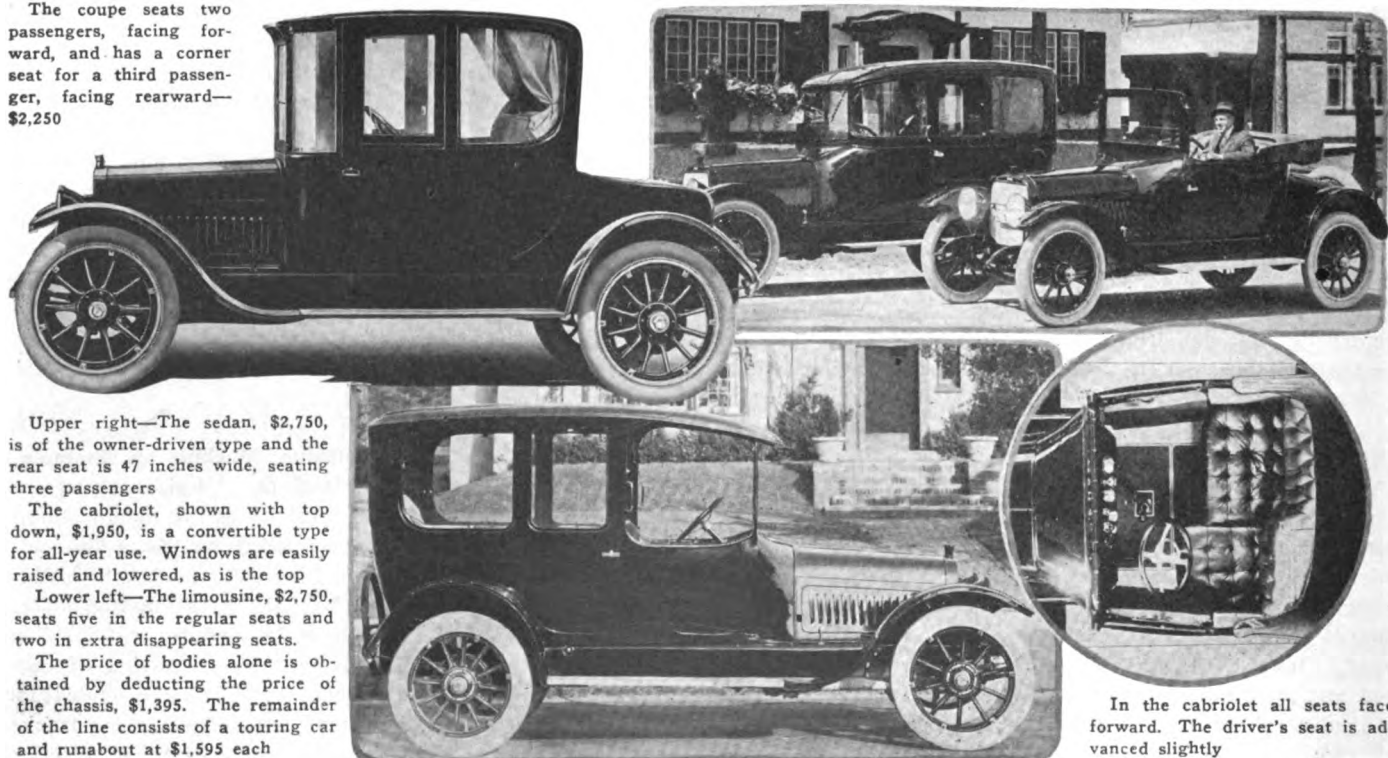
Will Safeguard Pedestrians

The Massachusetts No-Accident League has been formed in Boston for the purpose of minimizing danger to pedestrians. It is planned to investigate the cause of all accidents in which vehicles are concerned and to attempt to prevent similar ones. Legislation will be sought to have lights placed at intersecting streets and roads in cities and towns and on the State highways; for the establishment of safety zones for people entering or leaving street cars, and for placing policemen at all crossings near schoolhouses that are frequently used.

The officers of the new organization are prominent business men of Boston. Henry R. Loomis is president; Carroll L. Meins, vice-president, and George F. Hines, secretary-treasurer. Headquarters have been established at 153 Milk street. This makes the third such organization in Boston, the Safe Roads Association being the first, and the Highway Safety League the second.

Chandler Adds New Bodies for Use on Standard Chassis

The coupe seats two passengers, facing forward, and has a corner seat for a third passenger, facing rearward—\$2,250



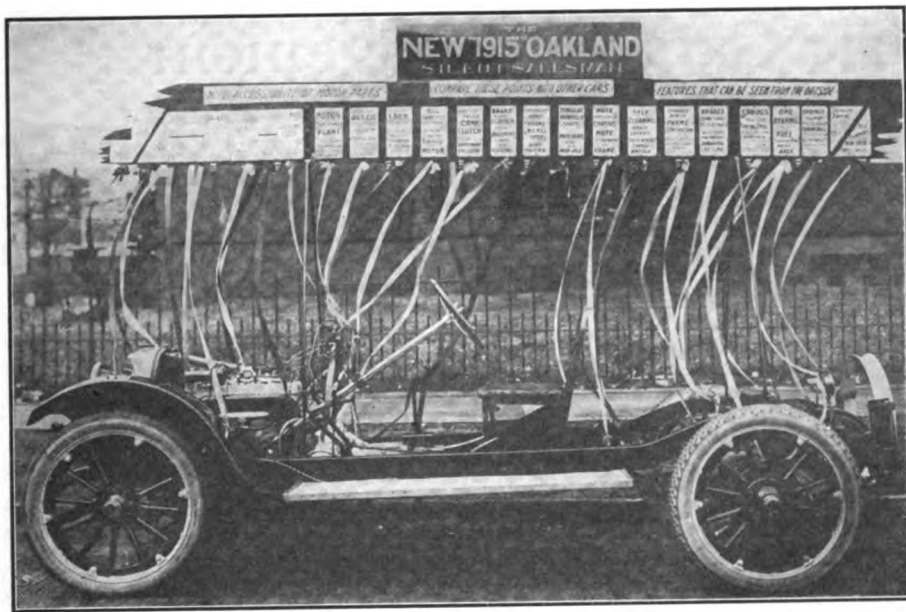
Upper right—The sedan, \$2,750, is of the owner-driven type and the rear seat is 47 inches wide, seating three passengers

The cabriolet, shown with top down, \$1,950, is a convertible type for all-year use. Windows are easily raised and lowered, as is the top

Lower left—The limousine, \$2,750, seats five in the regular seats and two in extra disappearing seats.

The price of bodies alone is obtained by deducting the price of the chassis, \$1,395. The remainder of the line consists of a touring car and runabout at \$1,595 each

In the cabriolet all seats face forward. The driver's seat is advanced slightly



This "silent salesman" of a Cleveland dealer, left standing at curbs, was always surrounded by a crowd of information seekers

CARDS AND RIBBONS SILENT SALESMAN

Cleveland Dealer Sets Up Object Study
That Gains Publicity

The Oakland Motor Co., Cleveland, O., found the above advertising stunt effective. It is self-explanatory.

Ribbons run from the various parts to cards on the board which call attention to features of the chassis. The materials needed were: Cherry board, 16 feet x 18 inches, notch-sawed at ends; made in the shop; cherry was used because of its lightness. Oilcloth placards were printed outside. Iron standards also were made in the shop. It required the services of three men a day and a half and the cost was \$38.85. L. E. Manly says results were gratifying.

The sign cards were:

1—I-beam drop forged axle, 10 in. clearance. 2—A mark of distinction, the V-shaped German silver radiator. 3—Extra heavy type crown fenders. 4—Note position of fan in radiator. 5—Centrifugal water pump.

6—Heat jacketed carburetor. 7—Oil reservoir with adjustable oil pump. 8—Valves made of tungsten alloy steel running in oil bath and dust-proof enclosure. 9—Removable cylinder head, permitting quick and simple method of cleaning carbon out of cylinders. 10—Distributor simple and accessible. 11—Steering adjusting nut.

12—Stewart vacuum gasoline feed, accomplishing marked economy in fuel consumption. 13—Motor unit power plant three-point suspension, all working parts enclosed. 14—Standard Delco starting system, positive gear drive in flywheel, all working parts enclosed.

15—Safety lock on ignition and lighting switch prevents operation of car, horn or lights.

16—Oil sight feed on dash, showing constant flow of oil to motor. 17—Leather-faced cone clutch in dust-proof enclosure. 18—Brake and clutch pedal adjustment simple and accessible.

19—Transmission gears chrome nickel steel heat-treated. 20—Tubular propeller shaft, Hotchkiss drive on rear axle.

21—Note simplicity of chassis, note strength of frame. 22—Self cleaning brake levers, require no oiling, cannot rattle. 23—Advance type of frame construction, shape of frame giving direct support to body its entire length. 24—Brakes extra large, quick acting adjustments that prevent dragging or rattling.

25—Springs made from special steel, 8 leaves 48 in. long, underslung construction, giving low center of gravity. 26—One bearing, full-floating type rear axle. 27—Springs mounted directly under frame rails. This construction eliminates overhanging brackets and all weight is carried directly over springs. 28—Gasoline tank capacity 15 gallons. Regular equipment non-skid tires on rear.

Effect of Color on Legibility

The value of color combinations in outdoor sign work has been investigated in experiments by Le Courier du Livre, a French publication, which determined that the most striking and legible combination and most easily read from a distance is black upon yellow. The order of legibility of combinations as determined is:

(1) Black on yellow; (2) green on white; (3) red on white; (4) blue on white; (5) white on blue; (6) black on white; (7) yellow on black; (8) white on red; (9) white on green; (10) white on black; (11) red on yellow; (12) green on red; (13) red on green. The customary combination of black upon white comes sixth in the list.

Buick Bulletin in Holiday Dress

The Buick Bulletin for January appears under one of the most attractive and clever covers that has appeared on a house organ in some time. It represents a country winter touring scene with a Buick, of course, in the setting. The contents are in a class with some fiction magazines, and the whole sheet is attractively done with halftones, run-arounds and red decorations.

LIMITS SERVICE TO 50 HOURS

SERVICE BOND	
STUDEBAKER AUTOMOBILES	
Mr.	Residence
Model	Motor No. Serial No.
H. O. DAVENPORT, Dealer	
BLISSFIELD, MICH.	
By	(Driver)

This is the service card used by H. C. Davenport, proprietor of the Blissfield Motor Works, Blissfield, Mich. He is a Studebaker dealer. The card entitles each buyer of a new car to 50 hours of service without time limit. By an arrangement with reputable garagemen in Adrian, Morenci, Hudson, Tecumseh and Clinton, all in Lenawee county, the Studebaker owner can get service in any of these towns.

The presentation of the card is sufficient to establish the owner's identity and the garagemen who extend service punch out the time in the margin and bill Davenport monthly at 40 cents an hour. He states that it constitutes one of his strongest selling points and does much to eliminate the perplexities of the service question.



Harry Fosdick, of the Wentworth-Fosdick Co., Hupmobile distributor in Boston, sent this New Year's calendar to a list of his personal friends and best prospects. There is an appropriate motto for each month which does not let the recipient forget the sender

Systematic Electric Garage Management Finds Solutions for Economic Problems

Current Supply a Big Stumbling-Block, But Easiest Way Proved the Best —All Work Done According to Understandable System

Chicago may be called the center of the universe, so far as the electric pleasure car business is concerned, and special interest attaches to the way in which electric garages are conducted there. This is the third of a series of articles describing solutions of real problems that have confronted Chicago electric garagemen. The fourth will follow in an early issue.

ONE of the problems which confronts the operator of an electric garage in the selection of the proper source of electric current is whether current shall be generated in the garage by the use of steam, gasoline, illuminating gas, etc., or whether it shall be purchased of the local power company. In Chicago, garage owners have found that while the generation of current, under certain conditions is almost as cheap as it is to purchase it, it is not so reliable and does not give the clean appearance to the garage that would be had with only control boards.

First Power Supplied By Steam

In the garage of W. L. Rudd & Co., three different methods have been in use up to the present time. When the garage opened ten years ago a steam plant for the generation of current was used. This was discarded because of the high cost of operation, the large amount of space required, and because of the attention needed. It was supplanted by a producer-gas plant, which was used for a few years and given up. Cost seemed to be the greatest fault. The producer-gas plant gave way to the present installation, which consists of three engines operating on illuminating gas. These engines operate generators which supply the current for battery charging.

Public Current Supply Cheapest

With the greater number of Chicago electric garages buying electricity of the Commonwealth Edison Co., the managers of the Rudd garage looked into the matter and found that purchased current in the end would be cheaper, if space, time and convenience are considered, and the result is that within a short time the garage will discard the present equipment and install motor-generators using local current. But this is in no sense meant to lower the value of the present equipment, for it has been giving satisfactory service for a number of years and for those contemplating entering the

electric garage business on a small scale it offers a good means of producing current.

The Rudd garage is located on the south side of the city not far from two other exclusive electric garages which are in the heart of the fashionable district of the city. The Rudd building is a one-story brick affair, with the inside walls concreted. The roof is trussed with cross-hatching from the truss beams to the roof itself. The floor is approximately 125 x 200 feet and is sufficiently large to accommodate 200 vehicles.

The floor plan (Fig. 1) gives the lay-

The office, 20 x 20 feet, is located between the two largest rooms in the front, so that all cars may be seen going in or out.

A small private office is connected with the larger one, and is used by W. L. Rudd, the manager. Behind the office is a long and comparatively narrow stock room, 15 x 50 feet. In this room is kept a supply of spare parts which are needed most, such as lamps, battery plates, battery material, connectors, electrolyte, tools for the shop, etc. A space separates the stock room from the motor room and behind the latter is the repair-shop.

Few Machine Tools Required

This is used for the repair of cars and contains a 16-inch lathe and a drill press equipment which has been found by the manager to be sufficient to take care of all the work coming to the garage. Aside from being used as a repair-shop, it also serves the purpose of a boiler room and a large steam boiler is located on one side and used for generating steam for heating the building in winter. This room is used also as a battery room and small trucks which can accommodate an entire set are employed to move the sets about. New batteries are made and old ones repaired.

Between the repair-shop and the stock room is a space set aside for the generators. One two-cylinder engine of 40 horsepower drives a 120-volt, 167-ampere Bullock generator, made by the Bullock Electric Co., Cincinnati, O. Another four-cylinder engine drives a 90-

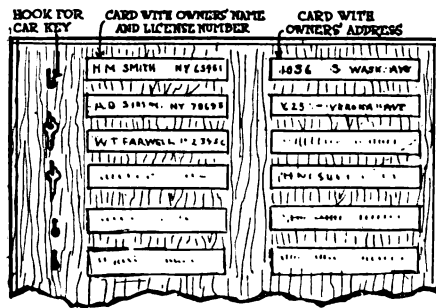


Fig. 2—Name board carrying car keys and owners' names, used in conjunction with floor-man's book

out of the various rooms used for storage and those where repair work and current generation is done. All the dimensions shown have been approximated.

The room facing the left entrance can accommodate 50 cars, that facing the right entrance 70, that in the rear of the latter 50, and the room in the corner about 30 cars.

CALL	DRIVER	LEFT	OWNER	CALL	DRIVER	CAR	BELL	CHARGING	REMARKS
						RETD	CHAINS	WEIGHT	
8:00 AM	Smith	7:25 AM	Jones	6:00 PM	Doe	6:25 PM	1	OK	2,754
									3,280
									12

Fig. 3—Call book which is used to keep track of the work of drivers and is always kept posted

horsepower Bruce-Macbeth generator, made by the Bruce-Macbeth Co., Cleveland, O. This generator will show 125 volts, 500 amperes, maximum load. The other engine is of four cylinders and is coupled to a 115-horsepower Jenney generator, made by the Jenney Electric Co., Indianapolis, Ind. An air compressor is also contained in the generator room. The fuel for the engines is taken from the city gas mains through meters. The plant is in charge of a \$100 per month engineer. The introduction of motor-generator sets will do away with this extra man and save this \$100 monthly.

Sectional Control Boards

The control board for the generators is in the same room a few feet from the entrance. The board was made by Schaefer Bros., Chicago, and is equipped with Weston meters. Opposite this board is one of the large charging boards of the sectional type. This board controls the charging of 30 sets of batteries. The other charging boards are located conveniently throughout the building, as shown on the floor plan. Two of these boards handle 12 cars, while two others can charge a set of batteries each. One of the latter is in the repair-shop and the other is in front of the generator room. These single chargers are used mostly to bring the batteries to life or boost sets already in the car. From the equipment given, it can be seen that 56 cars may be charged at once, and as additional business requires it, more panels may be installed.

The cables running from the boards to the charging racks are fastened to the wall and covered with a wooden case-ment, only the cable end protruding behind the car backed against the bumper. Each cable has a large 15-inch number painted over it and a record is kept of the line from which each car is charged. These boards are taken care of by the several floormen, who work on split shifts.

Close Check on Men

The working force of the Rudd garage comprises 20 men: One engineer, who has charge of the generator room; two floormen, in charge of the boards and the hikers or callers; two washers, one polisher, one window cleaner, seven callers, two repairmen, one car cleaner, one battery man, one decker, who cleans the tops of cars; one lamp cleaner, and a bookkeeper. The repairman, battery man and bookkeeper work during the day, while the rest work at night with the exception of the floormen and hikers,

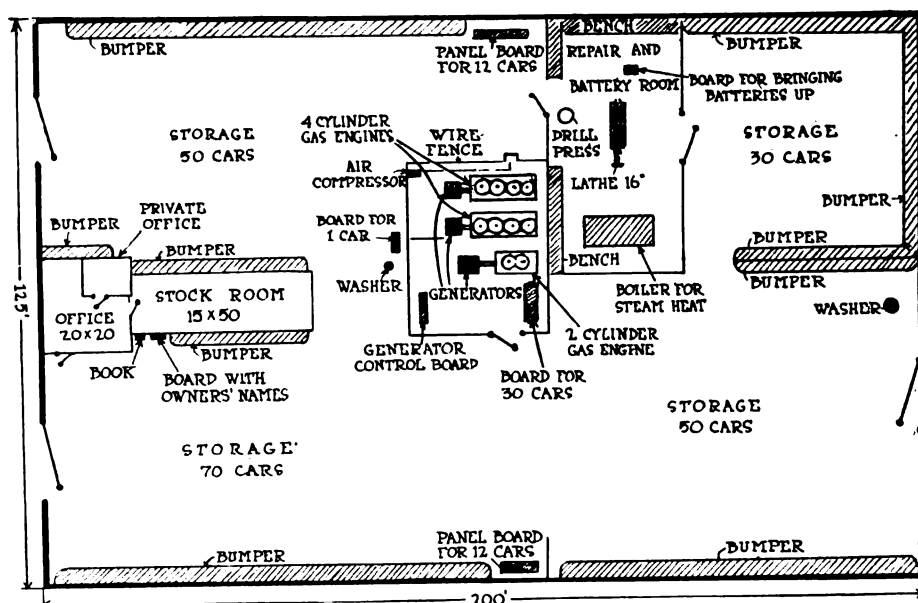


Fig. 1—Floor plan of the Rudd electric garage, giving layout of electric generating plant and other departments

who have split shifts, working part day and part night.

The floormen have direct charge of the hikers, and the system employed is unique. A large book, a page of which is reproduced in Fig. 3, is used to report the doings of the day. In the first column is listed the time the owner wishes to have his car in the morning; the next gives the name of the driver assigned to the job, and the third gives the time he left the garage with the car.

It is a rule that a car must leave one hour before the owner's specified time.

Checking Car Movements

The fourth column gives the owner's name, and the fifth the time the car is called for at night, and following it the driver's name and the time the car came into the garage ready to be washed, polished, charged, etc.

In the succeeding columns various information is recorded as to the condition of the car before it leaves the garage each day, the number of tire chains, for it has been found many owners lose a chain, and the condition of the bell and lights.

The speedometer mileage is then taken, the battery gravity recorded and the line from which the batteries were charged noted. The reason all this is done, the manager states, is to avoid all disputes with the owners regarding the condition of the batteries or the car.

All Disputes Avoided

If, for example, a car leaves with the batteries showing a gravity of 1,280 and the owner comes in at night with the batteries totally exhausted and complains of low mileage, an examination is

made for a short circuit. If low gravity is recorded by the floorman for say 12 cars, he makes it known to the manager, who has the charging board and all lines connected with it examined. The engineer is consulted as to the output of the generator, whether the gas engines were misfiring and causing low current production or whether any trouble was encountered in the generator control board. With the present system in force all car troubles may be traced, and if an owner complains he is shown the daily record and if correct he has no recourse.

Adjacent to the floorman's book is a large board, approximately 3 x 6 feet, upon which cards are placed, Fig. 2, giving the owner's name, address and the license number of the car. This board has the car key opposite the owner's card.

Charges Are Inclusive

When a hiker is sent away with a car by the floorman he takes a key from the board with him, and when the car is left on the street the doors are locked. The owner, of course, has a duplicate key. When a hiker calls for a car at night and brings it to the garage, he leaves the key in the car, and every morning the keys are removed and placed upon their respective hooks, where they are always kept.

An owner may call for a hiker any time of the day or night to have his car removed to the garage or delivered to his home. For this service and charging, washing, polishing and oiling, he pays a monthly rate of \$35, if he has a small car, and \$40 if it be a large one. This rate is uniform throughout Chicago.



Left—This scene, which joins the other at the center, points plainly to the comfort obtainable in a cabriolet in winter. Right—This as effectively indicates the pleasure of the converted car in summer

Snow and Flowers About a Cabriolet

Detroit Dealers Work Out an Effective Display Which Draws Crowds to Their Windows.

When almost every motor car going by slows up to take a look at your window display; when every street car has its line of faces pressed against the windows to see what you have in your window; and when pedestrians pause for five and ten minutes at a time to study your window display because it is pleasing to the eye and tells a concrete story at the same time, then you, Mr. Dealer, may feel a thrill of satisfaction and realize that your merchandising efforts are at least on a par with, if not ahead of, those made by the high-grade department stores.

The Window Tells the Story

For two weeks this is precisely what has been happening at the Bomb-Robinson store in Detroit. And the picture of the window display shown with this story explains more clearly than any words why the interest has been so keen.

By a series of carefully thought-out ideas that have clever merchandising principles as their foundation, the firm of Bomb-Robinson has educated the public of Detroit, and dealers, too, to the point where they are constantly thinking "What next?" and keeping their eyes on the Bomb-Robinson windows with pleasant expectancy. They have made their store the most talked of place of business in the State of Michigan and in a few years—less than three—have built a reputation that has given them the confidence

and respect of every motor car buyer and salesman in the territory.

And the best thing about their success is that it has not and does not depend upon secret methods, cut-rate prices, big newspaper advertising expenditures, extravagant salesrooms or any other of the features that have ruined so many retail motor car concerns. Whatever success has been theirs has come through a realization on the part of both members of the firm that the motor car business is a merchandising business; that it is not a game but a retail business in which the prime factors are a good car, a well-balanced organization from the standpoint of both sales and service, and clean-cut merchandising ideas.

Shows Car's Adaptability

The window display, which shows, without the use of any language, that the cabriolet is a car adapted equally well to summer and winter service, cost approximately \$100. When Bomb and Robinson got the idea, the first person they interviewed in regard to carrying it out was the scene painter of one of the Detroit theaters. His work cost them \$40. The rest of the money went to the floral company which made the snow man from cotton batting with dark "everlastings" as buttons, eyes and nose, except for \$20 which went for white canvas floor covering used in the winter scene.

Considering that the display will be

good for at least four weeks the outlay was not excessive. And let it be remembered that the scenery can be used again and the canvas floor covering will be useful many times in the future.

Aside from the painted scenery the other properties consisted of:

Canvas floor covering.

Snow man.

Bare bushes trimmed with "snow" and powdered mica, in the winter scene.

Southern smilax, used for decorations in the summer division.

Wicker For Summer Scene

In the summer scene wicker furniture and a green carpet gave the seasonal touch. Note that the wall dividing the scenes is two-sided, giving the stone-trimmed brick wall effect on one side and the plain stone wall on the other side.

"How did you come to get up this display?" was asked Walter Bomb.

"Wanted to sell cars and thought this was a good way to do it. We were sold out of limousines and sedans, and, as you know, there is little use trying to sell touring cars this time of year, so we thought we would take a whirl at the cabriolet. This is a type of car that we believe is the most practical machine a man can own. But, some way or other, people have not paid as much attention to it as they should. We plead guilty to neglecting it like the rest. But we are not doing so any longer.

"We wanted to challenge the attention of the public and drive home the advantages of this type of car. It seemed to us that the best way to do that was by visualizing its advantages the way you see here. Hardly a car goes by that does not slow up and there isn't a street car that goes by that doesn't have its



Left—This shows how Towell's big electric sign stands out against the blackness of the city's night sky. Right—The building is one of the most attractive and complete dealer establishments in the West

quota of 'rubbers.' People in the hotels are talking about it. Everybody I meet speaks about it. Dealers call us up and congratulate us. It is another of those things that set people talking. It carries out the impression that we are very much alive and up-to-date. It isn't that it is going to sell a whole lot of cars. It has helped sell some; and there are many who have been impressed with the advantages of the cabriolet whom we will doubtless hear from later. But aside from all that we feel that we have done a very profitable thing.

"Our showroom isn't large. It measures exactly 40 x 40 feet. We split the space evenly between the two seasons. It doesn't make a wonderful showing—but it's plenty large enough. And almost every dealer with a similar car can work up a like display if he wants to. The same thing can be done in Cleveland, Chicago, Buffalo, Toledo or St. Louis, or any other place where the dealer has a good showroom. And if any dealer tries this or similar stunts he will find that in six weeks' time his place of business will stand out from the rest and he will become better known than by six years of sales work done in other ways. It is simply applying merchandising ideas to the automobile business.

"Did we advertise? Yes, we used our regular 20-inch space in the newspapers. And we did things differently there: instead of showing a cut of the car and talking its advantages we used no cuts and we advertised the exhibit and the scenery and didn't say a word about the car. Aside from our regular space in the newspapers we spent no money for advertising. It has been a success. It has created more comment than anything else we ever did. It has added to our reputation for doing things. Any dealer anywhere can do the same thing."

Cleveland Dealer Enters New Home

Towell Completes Structure Built From Proceeds of Modern Selling and Efficient Service

The new building of the Cadillac Co. of Cleveland, of which T. H. Towell is president and treasurer, while not one of the largest known to the industry, is nevertheless one of the most complete. Perhaps the reason back of the growth of this Cadillac company may be glimpsed when it is known that while the salesrooms occupy 10,000 square feet the service station in the rear of the salesroom has in excess of 17,000 square feet—almost double the salesroom.

And the second floor, beyond that department specifically known as the service station, comprising facilities for inspecting, washing, polishing cars and charging batteries at any time of day or night, is devoted exclusively to the storage of parts for all Cadillac models. In other words, the dominant fixed principle of this company is to take greater care of the Cadillac owner than of the prospective buyer.

Speedy Service

Repairs and replacements are made in the shortest possible time. The Cadillac owner in Cleveland does not have to wait. Perhaps that is one reason why the season of 1914, closing November 30, showed a 100 per cent increase in business over the preceding year.

The third floor of this new building includes a complete painting and upholstering department. Tops are furnished, seats rebuilt and recovered and general upholstering and body painting

done under one roof with promptness and dispatch. A tinsmith, blacksmith, radiator man and lamp man are employed continuously, so that the Cadillac owner rarely has to wait—in season or out.

On the fourth floor is a completely equipped machine-shop where almost any piece of machine work necessary in the construction or rebuilding of a Cadillac can be turned out by workmen familiar with Cadillac construction. Lathes, gear pressers for removing gears from shafts and every machine necessary for doing the most difficult work are used.

Big Sign an Asset

One feature of the new building that will appeal to every dealer is the big electric sign on top. It is double "V" shaped and can easily be read going up or down Euclid avenue. At night it stands out startlingly—the photograph shows this feature plainly and unmistakably.

Towell believes in modern, progressive methods. He is the literal embodiment of the service-first ideal and has made it pay. Seven salesmen are employed, and they work under the direction of Sales Manager James Fitzgerald. Besides the salesroom on the first floor there are neat private offices for the president, the sales manager and his assistants. Comfortable chairs are scattered about the carpeted floor, providing a cosy, inviting place for waiting customers and callers.

SPEEDOMETER MAKER HAS UNUSUAL SERVICE PLAN

**Van Sicklen Company Cooperates With
Dealers by Furnishing Speed-
ometer Repair Parts on
Consignment**

To render greater service to the owners of cars which are equipped with the Van Sicklen speedometer, the Van Sicklen Co., Aurora, Ill., has promulgated a service plan. Car manufacturers adopting Van Sicklen equipment are requested to furnish the Van Sicklen company with a list of dealers. These dealers are asked how many cars they will dispose of during the year and to each dealer is sent a service package containing the parts he is likely to need for the cars he will sell. These are handled on consignment, charges prepaid, and are to be accounted for. Each dealer is permitted to use discretion regarding replacements.

To Build Farm Tractors

The Utility Steel Tractor Co., recently organized with \$24,000 capital in Antigo, Wis., by D. S. Stewart, F. A. Hecker and N. C. Woodin, former chief engineer of the International Hoist Co., Antigo, will manufacture and market a line of general utility power devices for agricultural and industrial uses. A light farm tractor to sell at a low price is now being constructed for demonstration purposes. For the present the concern will contract with foundries and machine shops for its

machines and later will establish a plant of its own.

Supplymen Hold Annual Dinner

The Jackson Motor Supply Co., Pittsburgh, held its third annual dinner at the Rittenhouse in the East End the evening of December 22. Moving pictures were exhibited of the manufacture of tires at the Firestone factory. The Jackson company commenced business less than eight years ago and is now one of the leading supply houses. The members are C. C. and K. K. Jackson.

To Build Crown Prince Wheels

The Crown Prince pressed steel wheel which is manufactured at Ohligs, Germany, and imported by Max Bachem, who introduced it at the New York show of a year ago, will be manufactured in this country under foreign patents by the Detroit Pressed Steel Co., Detroit, maker of steel frames and other steel parts.

Bachem, who has been engaged as sales manager, reports that the German factory is busy supplying the wheels to the government for war purposes. The wheel is adaptable to both passenger and commercial service and presents much the same appearance as the wooden wheel.

Woods For Commercial Use

Two types of delivery cars are offered by the Woods Mobilette Co., Harvey, Ill., for the spring trade in addition to a variety of pleasure car designs. One of the delivery models has a full panel, enclosed body, and the other an open delivery box body with a folding top.

These delivery cars are built on the same chassis as the pleasure car models.



Harry S. Houpt, Inc., New York Mitchell distributor, has adopted this method of using a large mirror to give a rear view of a car to those who pass his show windows

The construction includes four-cylinder, 10-16-horsepower, water-cooled motor, shaft drive, sliding gear type transmission, leather-faced cone clutch, full-floating rear axle, and an over-and-under type of frame construction with long springs, long wheelbase, small unsprung weight and low center of gravity. The Mobilettes sell at \$380.

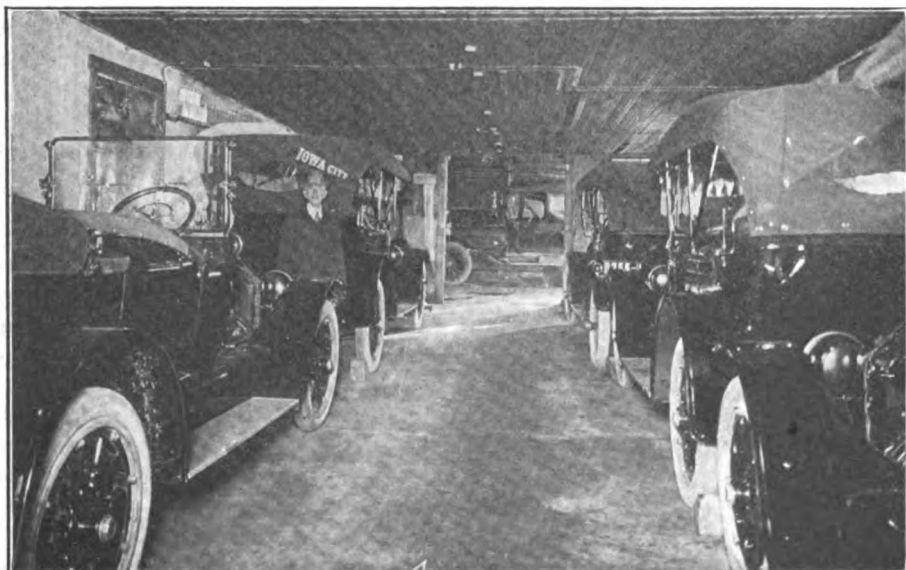
Markets New Resilient Wheel

The T. S. Wheel & Mfg. Co., 254 Oregon street, Milwaukee, has placed on the market a ball bearing, resilient wheel for motor vehicles, which it has been working on for nearly a year. The concern was organized in April, 1913, with \$500,000 capital and a large shop has been equipped with dies, punches, milling machines and other tools. The wheel, invented by T. J. Smulski, formerly of Chicago, consists of 12 chilled steel balls of $\frac{5}{8}$ -inch diameter, so arranged that as the wheel is forced upward by the resistance of the roadway, the axle is forced downward and the stresses equalized. The wheel is equipped with solid tires or sectional solid segments and is built in various weights and sizes corresponding to the weight of the car upon which it is to be used. The guarantee is for three years.

Dividends Declared

The regular quarterly dividend of $1\frac{3}{4}$ per cent on the preferred stock of the Willys-Overland Co. has been declared and will be payable on January 1, 1915, to stockholders on record December 21. The dividend on the common stock for the year totaled 11 per cent.

CLEANLINESS A FEATURE OF THIS GARAGE



James H. Guzman, who operates the Cadillac garage in Iowa City, Ia., and handles Cadillac and Paige cars, insists on clean floors. He appears in the picture

PACKARD BRINGS OUT NEW 1- TO 6-TON TRUCK LINE

**Overhead Worm Drive and Centralized
Steering Column Control—Enters
Light-Duty Field—Have
Starters**

The Packard Motor Car Co., Detroit, Mich., has just made known the details of its entirely new line of motor trucks, which range in capacities from 1 to 6 tons. These have been in the process of development for 3 years and differ from anything Packard has heretofore turned out in a number of respects. They have overhead worm drive, and the control is centralized below the steering wheel and on the steering column.

The 1-ton model marks the entrance of the big company into the field of light-duty vehicles. A point is made of the fact that each of the six models is a separate engineering design and that for this reason, they do not all adhere to exactly the same construction, although in the main they are all built along the same lines. The 1-ton is somewhat differently constructed from the 2-, 3- and 4-ton types, while the 5- and 6-ton models may also be classed as being in another group.

The details of the 1-ton and the two heavier models, the 5- and 6-ton, are not completely divulged at this time, but specifications of the 2-, 3- and 4-ton are available, however. In general, though, they all incorporate four-cylinder block-cast engines which are three-point suspended. They have left drive and left control levers, shaft drive direct to the worm and three-speed gearsets. They are automatically governed and provision is made for lighting and cranking by electricity if desired; another feature is the power take-off, which makes it a simple matter to drive independent mechanism by the truck power.

The 3- and 4-ton models have a $4\frac{1}{2}$ x $5\frac{1}{2}$ motor of 32.4 S. A. E. horsepower. It has four-bearing crankshaft and camshaft and incorporates a multiple dry-disk clutch. The drive is through the Packard progressive three-speed gearset to the worm gearing. The worm is of the straight type, and of steel and the wheel is of bronze. Timken bearings are used in the axle construction, which is of the floating form. The frame is a channel section and suspension by semi-elliptic springs all around. The wheelbase of either model is 13 feet standard, or 15 feet optional. The 3-ton has 36 x 5 tires

and the 4-ton the same size front tires and 40 x 5 rear. The rear set are duals in either case.

The 2-ton has a $4 \times 5\frac{1}{2}$ engine of 25.6 horsepower S. A. E. rating and adheres to the same general design throughout as the 3- and 4-ton types. Its wheelbase is 12 feet standard or 14 feet in the long size, and tires are 34 x 4 with the rear dual.

The price of the 2-ton truck is \$2,800; of the 3-ton, \$3,400, and of the 4-ton, \$3,800. If the Packard-Bijur system of lighting and cranking is fitted at the factory, it adds \$225 to either of these figures.

The outward appearance of the new Packard series is much the same as the older models. The motor is placed forward of the driver's cab and the radiator has the distinctive Packard shape. The hood is provided with louvres.

It is expected that the engineering department will have given its O. K. to the 5- and 6-ton models by the end of February, and that in three or four weeks, the details of the 1-ton will be forth coming.

Van Alstyne Advertising Manager

T. B. Van Alstyne has been appointed advertising manager of The Class Journal Co., publisher of Motor World, with headquarters at 239 West 39th street, New York city.

Bretz Now Bearings Company

The Bearings Co. of America has succeeded the J. S. Bretz Co., New York city, importer and distributor of F. & S. bearings; the Fichtel & Sachs Co., and the Star Ball Retainer Co., the latter two of Lancaster, Pa. All three of the old companies were dissolved in 1914 with the object of concentrating the entire manufacturing, warehousing, shipping and service departments in Lancaster, Pa., and the entire sales department at 250 West 54th street, New York city.

No change has been made in the personnel of the general management of the business and the sale, production and importation of F. & S. annular ball bearings, ball thrust bearings, Star ball retainers, German steel balls and Bowden wire mechanism will be continued under the same management as heretofore.

King to Banquet Parts Makers

The annual banquet by the King Motor Car Co. to all manufacturers supplying parts used in King cars will be held the evening of January 22; during the afternoon open house will be held at the plant on Jefferson avenue, Detroit. This will be the second annual banquet and it is expected that about 200 will be present.

COOPER IN STUTZ WINNER OF SAN DIEGO ROAD RACE

**Averages 65.35 Miles an Hour in Opening of Exposition Speed Carnival—
Contests to Continue Two
Months**

Averaging 65.35 miles per hour for 305.82 miles, Earl Cooper, driving a Stutz on Saturday last won the San Diego exposition road race, run over the dangerous Point Loma course, and opened the speed carnival which will be held in California for more than two months to come.

The time made was the slowest of Cooper's career and the slowest made in any race on the coast since the Inaugural of the Santa Monica event in 1910 when Harris Hanshue, the victor, averaged 64.45 miles an hour.

Cooper's time for the 51 laps was 4:40:10 $\frac{1}{5}$. Billy Carlson, in a Maxwell, was second and hung up a new World's non-stop record; he averaged 64.96 miles an hour and drove the 305 miles without a stop as against 301 driven by Barney Oldfield at Corona, where he established a non-stop mark in the Corona speed-fest Thanksgiving Day. Carlson's time is so slow compared with the master driver that it would be unjust to credit him with a better performance than that of the veteran, who averaged 86.2 miles an hour.

Tom Alley, at the wheel of a Duesenberg, finished third, with a 63-mile-an-hour average; he drove a plucky race. Ruckstell, in a Mercer, took fourth money after playing in hard luck from the start. Taylor (Alco) was fifth, and the last man to get the checkered flag. Rallaghan (Duesenberg) was running at the finish but was flagged.

Eighteen cars started, but all but six were eliminated. Among the drivers to drop out were Oldfield, Burman and Rickenbacher, three favorites before the start. There were several accidents but only one driver sustained injuries, Callaghan breaking two teeth. Grant, in a Sunbeam, was the only entry scratched.

For the first time in the history of road racing Federal troops guarded the course.

Overlands to Have Dixie Magnetos

The Splitdorf Electrical Co., Newark, N. J., has secured a contract for equipping the entire 1916 output of the Willys-Overland Co., Toledo, O., with its new Dixie high-tension magneto.



The members of the Motor & Accessory Manufacturers banqueted Wednesday evening of show week at the Waldorf-Astoria. It was an evening devoted solely to enjoyment. There was not a single speech. The menu was interspersed with vaudeville of a high class and there were many renewings of friendships which are revived annually at this most popular of motor trade functions.

GARAGEMEN OF NEW YORK STATE FORM ASSOCIATION

**Plan Use of Credit Card and Will Buy
Cooperatively—Will Work in Har-
mony With Existing Trade
Organization**

About twenty representative garagemen of New York state, at a meeting in New York city Wednesday, January 6, formed the United Garage Associations of New York State, a state organization of garage owners. William Haradon, Royal Garage, New York, was elected president. The other officers are: First vice-president, John Van Benschoten, Poughkeepsie, Ford, Reo, Studebaker and Chalmers; second vice-president, W. D. Sweet, Knickerbocker Garage, Speedwell dealer, Binghamton; treasurer, A. H. Dudley, Dudley's Garage, Mitchell, Rochester; general secretary, Harry Waring, New York. The organization work leading up to the meeting was done by Waring, who aims to have the association represented in Chicago January 27 and 28 at the meeting which has been called by the Garage Owners Association of Illinois for the purpose of forming a national organization.

Prior to the organization meeting garagemen in many large and small New York state cities had been interviewed and there was considerable discussion as to the advisability of a garage association in New York, inasmuch as there is now existing the Automobile Trade Association of New York State, which admits all tradesmen, dealers, garagemen and others.

The consensus of opinion, however, was that an association in which membership is on a strictly garage basis will be able to work in harmony with the other in matters which affect all interests and that strictly garage matters can be handled by the union of the garagemen. Membership is to be based on garage ownership, but the garageman who is also a dealer is eligible. The category also includes repairmen.

One of the immediate objects of the body is the passage of a garage lien law which will give the garageman and repairman a lien on a car after it has left his possession with the bill unpaid; the present New York lien law gives a lien only so long as the car is in the possession of the garageman. A similar movement is under way in Illinois.

Another plan contemplated is the organization of a card credit and identity



THE ANNUAL DINNER OF THE NATIONAL AUTOMOBILE CHAMBER OF COMMERCE—Colonel Charles Clifton, as toastmaster, struck the dominant note of the National Automobile Chamber of Commerce, Inc., banquet held at the Waldorf-Astoria last week Tuesday, when he spoke of the friendship among the members of the automobile industry. This is the first annual banquet of the Chamber which represents the outgrowth of the Association of Licensed Automobile Manufacturers, the National Association of Automobile Manufacturers and the Automobile Board of Trade. There were 480 in attendance

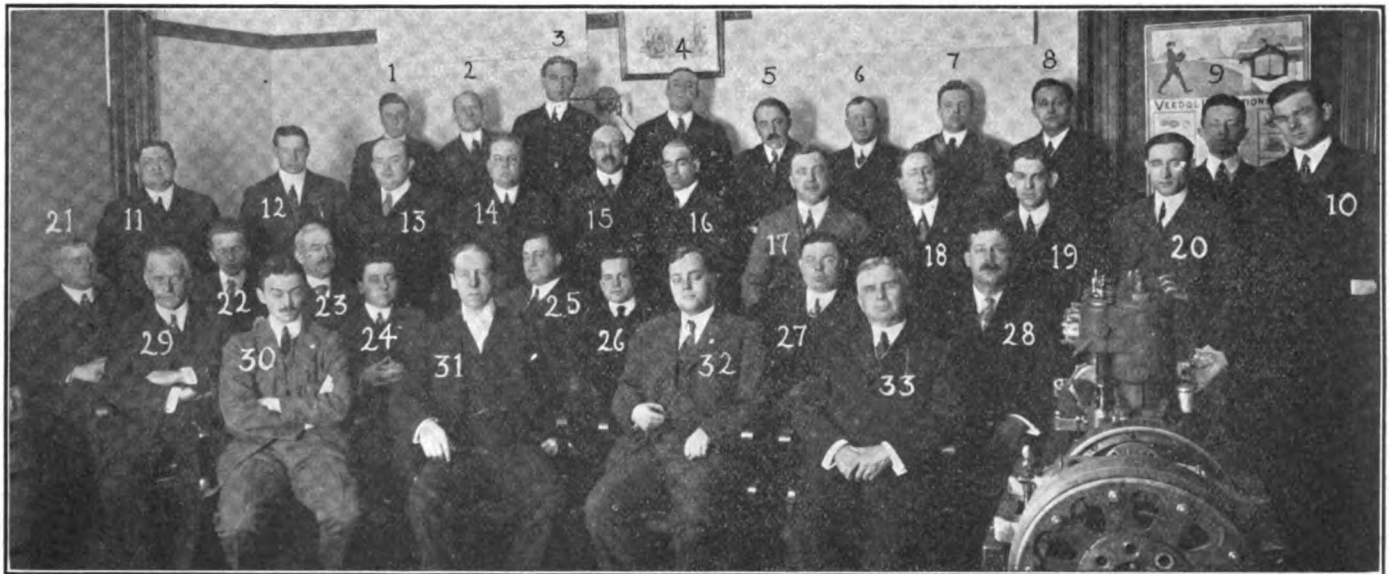
system whereby a member garageman may issue to his customers in good standing a monthly card which will enable the car owner to secure emergency credit of any member in any city and will entitle him to certain discounts. The card is to be made a revenue-producer, eliminating the necessity for dues after the

work is under way. Complete details are not yet worked out.

Association purchasing is also to be a part of the plan; Waring was tentatively named to represent this branch of the association and the committee will be permanently formed later. It is proposed to secure garage supplies at about

half what some of them now cost, a plan which is followed by the Illinois association.

That the best interests of all may be served and the work of the organization be actively pushed it was voted to hold a general convention in Albany, Wednesday, March 3. At this time any uncom-



A GROUP OF PLATT & WASHBURN REFINING CO. MEN IN THE COMPANY'S OFFICE DURING THE NEW YORK SHOW—1—E. J. Inge, Boston. 2—F. C. Braden, Long Island, N. Y. 3—Neil Burgess, Boston manager. 4—A. P. Ross, New York city. 5—G. W. Brennan, Providence. 6—W. A. Beach, Bridgeport. 7—E. J. Beebe, Boston. 8—C. A. Haager, New York city. 9—George Shortmeier, New York city. 10—J. M. Stockfish, Pacific Coast manager. 11—H. C. Graham, New York city. 12—F. W. Tucker, Albany. 13—E. G. Pratt. 14—S. S. Holt, Boston. 15—H. R. Butler, Springfield. 16—D. H. Pierce, Boston. 17—W. S. Reynolds, Syracuse manager. 18—F. H. Dickison, Philadelphia. 19—G. S. Richards, secretary. 20—J. E. Matthews, New York city. 21—W. J. Schatz, England. 22—Sherburne Whitney, Boston. 23—H. A. Parsons, New York city. 24—H. A. Butler, Portland. 25—F. J. Cusack, New York city. 26—R. A. Ludlow, Boston. 27—W. H. Reese, New Jersey and Pennsylvania. 28—Wm. Crelin, Newark. 29—J. Whitney, Boston. 30—B. D. Benson, vice-president. 31—H. J. Guthrie, president. 32—P. N. Miller, treasurer. 33—J. R. Bacon, Philadelphia, lubrication manager

pleted details of organization will be whipped into shape.

Directors were named for various cities, some of which have formed or will form local organizations; they are: New York, C. Howard Potter, secretary of the New York Garage Association; Uptown Garage; Brooklyn, Charles F. Batt, president of the Brooklyn Garage Owners Board of Trade; Albany, George W. Leahy, Kingsbury-Leahy Co.; Amsterdam, H. T. Warnick, Greene & Warnick; Utica, Frank Miller, Utica Motor Car Co.; Rochester, J. Lawrence Hill; Elmira, Ward La France; Binghamton, H. W. Whipple; Poughkeepsie, John Van Benschoten; Glens Falls, Milo J. Graves, Glens Falls Automobile Co.; Saratoga, N. B. Ross; Mount Vernon, Joseph A. Hennings, Hennings Auto Garage; Catskill, Harvey J. Scutt; Hudson, William Petrie; Newburgh, Arthur Youngs; Kingston, Martin H. Snyder; Schoon Lake, Senator James E. Emerson; Hornell, C. A. Burdette, Seneca Garage.

Committees named were: Legislative—John Van Benschoten, Harry Waring and Senator James E. Emerson.

Purchasing—Harry Waring, tentatively; others to be added.

By-laws—Charles F. Batt and C. Howard Potter.

Vacancies—C. Howard Potter, Maurice Segall, New York, Aphorp Garage, and Harry Waring.

Chicago delegate—William Haradon. Counsel—Melvin R. Bender, Albany, of Arnold, Bender & Hinman.

Finance—C. Howard Potter, John Van Benschoten and Harry Waring.

Van Dervoort S. A. E. President

W. H. VanDervoort, president of the Moline Automobile Co., is the new president of the Society of Automobile Engineers. The other officers elected were: F. R. Hutton, first vice-president; J. A. Anglada, second vice-president; A. B. Cumner, treasurer, and C. B. Rose, Velie company; John Wilkinson, Franklin company; W. P. Kennedy and F. M. Germane, Standard Roller Bearing Co., councillors.

President Leland opened the meeting with an address on the work of the society and the future of automobile engineering. His theme was the value of training men who could truthfully say that they "knew how." He dwelt on the value of producing engineers who turn their attention to the production end of automobile manufacture. He stated in his address that the decreasing number of concerns would leave more trained engineers free to take up the work of production engineering.

ENGLAND AGREES TO LET RUBBER TRADE CONTINUE

But Shippers Must Give Satisfactory Guarantee as to Purpose and Destination—Buyers Agree to Terms

The British Government has provisionally come to an agreement with the American rubber exporters in Great Britain which will permit of licenses being given under proper guarantees for the export of plantation rubber to the United States from London and Liverpool.

A statement issued by the British Embassy at Washington said: "Manufacturers wishing to obtain large shipments will be required to give bond through their agent in London. In other cases shipments will be allowed to approved manufacturers and dealers who signify their willingness to sign appropriate guarantees. Shipments will be addressed to a bank in New York city, which will not deliver rubber until the purchaser has signed and deposited a guarantee with His Majesty's Consul General at New York city and he sanctions delivery."

The statement goes on to state that manufacturers in the United States must guarantee not to export any raw waste or reclaimed rubber except to the United Kingdom or British possessions; not to sell rubber now delivered, but to use it in their own factories; to execute orders for manufactured goods from neutral European countries from stocks in the United Kingdom. Shipment to manufacturers who have given a bond will be allowed direct.

The above announcement has imparted a weaker tone to the rubber market and prices have declined. Fine Up-river Para dropped 2 cents, quoting at 67 cents. Pale crepe from Ceylon dropped from 77 to 66 cents.

A committee of rubber manufacturers has been formed to see that the conditions of the British embargo are lived up to as far as is possible, so as to prevent the restoration of the export prohibiting order. This committee has informed the Treasury Department at Washington that it will organize a service to prevent the falsification of manifests which might involve reexports of the British rubber products, and it will establish a secret service or institute a clearing house to guard against trading in rubber under false pretenses or without authority.

Favorable news has been received from B. G. Work, of the Goodrich company, who went to London to cooperate with the British dealers, who found themselves overloaded with an enormous stock of crude rubber which they were not allowed to sell.

DEALERS GUESTS OF MAKERS OF CARS DURING SHOW WEEK

(Continued from page 11)

dealers' affairs. Not only did Sales Manager Arthur Holmes talk, but practically every dealer took part in the discussion and the result was a closer knitting together of the whole selling organization.

Confidence of the dealers in the company and the company in its dealers assumed crystallized form and many dealer problems were discussed. Andrew Auble, Toledo, O., was one of the principal speakers on sales methods. Dealers present were:

Hugh H. Goodhart, Syracuse, advertising manager; E. L. Baker, Syracuse; William S. Lee, Wilkes-Barre, Pa.; O. D. DeWitt, Scranton, Pa.; Cowles Tolman, New Haven Conn.; James G. Farrell, Cortland, N. Y.; Lahon L. Sterner, South Bethlehem, Pa.; Elbert E. Bellows, Saranac Lake, N. Y.

G. A. Wonnacott, Waymart, Pa.; S. F. Carpenter, Carbondale, Pa.; A. G. Perretz, Brooklyn; William M. Davis, Kingston, N. Y.; Walter Richardt, Trenton, N. J.; John Sykes, Jr., Trenton, N. J.; George W. Belden, Canton, O.; C. E. Hull, Syracuse.

R. B. Kuhn, Canton, O.; S. H. Lewis, Binghamton, N. Y.; C. J. Donlan, New York city; C. W. Rockwell, Cleveland; J. E. Hade, Syracuse; Walter Kneip, Baltimore, Md.

A. E. Glisan, Cumberland, Md.; H. W. Glisan, Cumberland, Md.; W. E. Baker, New Windsor, Ind.; James Sweeten, Jr., Philadelphia, Pa.; Homer C. Rice, Philadelphia; F. B. Williams, Worcester, Mass.; W. L. Wilcox, Providence.

F. V. Price, Jr., president of the Elizabeth Automobile Co., Elizabeth, N. J.; W. L. Mallon, manager, Mallon & Earle, Newark, N. J.; F. S. Pfeiffer, Rutland, Vt., Rutland Machine & Auto Co.; Thomas Hughes, Paterson, N. J., Hughes Garage Co.

Glinn A. Tisdale, New York, Franklin Motor Car Co.; George Ostendorf, Buffalo; E. T. Turner, Greensburg, Pa., Standard Automobile Co.; Kent Bender, Newark, N. J., Mallon & Earle; George Mason, Newburgh, N. Y.

Maxwell men at the show were:

Walter E. Flanders, president and general manager; Walter M. Anthony, comptroller; Carl Tucker, treasurer; Jesse A. Vail, chairman of the board; C. E. Stebbins, assistant sales manager; Robert T. Walsh, advertising manager; W. H. Weingar, special representative.

A. E. Richmond, superintendent of service; Chas. Gould, manager of service; E. M. Greene, supervisor, zone 1; J. J. Plath, supervisor, zone 2; W. D. Paine, supervisor, zone 3; E. H. Roberts, special representative.

LeRoy G. Peed, exhibit manager; Roland Rowland, assistant to exhibit manager; H. J. Vogler, district salesman; J. R. Garth, district salesman; E. W. Davenport, foreign sales manager.

F. E. Miller, service representative; S. H. Heft, special representative; W. B. Brady, special representative.

District salesmen—J. R. Hawks, W. S. Olney, R. F. Coburn, A. E. Binford, Wright Gillies, L. J. Blunden, Walter Marsden, J. P. Headley, L. F. Smith, B. H. Geddis, A. M. Potts and R. L. Malkin.

W. F. Lehman, special representative.



DURING THE NEW YORK SHOW A GROUP OF MEN WHO WERE WITH THE HARTFORD RUBBER WORKS IN 1904 DINED TOGETHER AT THE ASTOR. MANY OF THEM ARE NOW WITH OTHER COMPANIES—1—M. C. Stokes, United States Tire Co. 2—Chase Langmaid, Federal Rubber Co. 3—H. C. Severance, Racine Rubber Co. 4—W. R. Barnes, Lee Tire Sales Co., Philadelphia. 5—J. Pate-naude, United States Tire Co., New York. 6—Ben Snowman, Continental Rubber Works. 7—E. S. Edwards, Racine Rubber Co. 8—E. S. Benson, Ford Motor Co. 9—Joseph Rental, United States Patent Fastener Co. 10—Charles Clark, United States Tire Co., Hartford. 11—W. H. Reed, United States Tire Co., New York. 12—J. E. Tourtilotte, Ajax-Grieb Rubber Co. 13—Harry Snyder, United States Tire Co., Newark. 14—D. W. Pinney, Kelly-Field Co. 15—E. S. Roe, United States Tire Co., New York. 16—E. E. MacMaster, United States Tire Co., Detroit. 17—J. W. Gilson, L. P. C. Motor Co. 18—Lewis D. Parker, Billings & Spencer Co. 19—Harry Plow, Midgley Tire & Rubber Co. 20—E. H. Brandt, Hudson Motor Car Co. 21—W. G. Fewell, Lee Tire & Rubber Co. 22—W. H. Kirkpatrick, Pittsburgh, Pa. 23—R. L. Kingston, New York. 24—Carl Chandler, Cadillac Motor Car Co. 25—H. E. Field, Kelly-Field Co.

SALE OF MOTZ PRODUCTS NOW GOODYEAR BUSINESS

Formal Transfer to Take Place February 1—Motz Users to Have Benefit of Goodyear Service System

The Goodyear Tire & Rubber Co. has taken over the sale of the products of the Motz Tire & Rubber Co.

The transfer of sales will formally take place February 1. On and after that date Goodyear will make all sales and adjustments. In the meantime special representatives of the Motz company will call at all Goodyear branches to make sure that all details are handled without confusion and that the trade is taken care of.

By the new arrangement users of Motz tires will have the use of the service provided by Goodyear branches in all the principal cities of the country. Hitherto Motz tires have been handled by distributors in various cities, but hereafter the sales methods and policies applying to them will be the same as apply to other products in the Goodyear line.

For the present the sale of Motz tires will be handled as a part of the work of the Goodyear Motor Truck Tire Department, under the direction of C. W. Martin, Jr., manager of that department. The Motz line consists of Motz High Efficiency cushion tires for electrics.

Motz High Efficiency commercial cushion tires for gasoline and electric commercial cars, and Motz Cushion Side Flange truck tires.

New Westinghouse Department

To care for its growing motor car department the Westinghouse Electric & Mfg. Co., Pittsburgh, has created an Automobile Equipment Department, which will handle the production and sale of accessories, including starting, lighting and ignition equipment. G. Brewer Griffin, heretofore in charge of the Detail and Supply Department, has been made manager. While the office is new to Griffin the duties are not, for he has had charge of the company's motor car business since its inception.



G. Brewer Griffin

CONSOLIDATED CAR BUYS ABBOTT MOTOR BUSINESS

Will Continue the Car and Retain Much of the Old Organization—Gerber Relinquishes His Part in Enterprise

The Consolidated Car Co., a new Michigan corporation, has purchased the assets, good-will and trade name of the Abbott Motor Car Co. The officers are: President, R. A. Palmer; vice-president, A. C. Knapp; secretary-treasurer and general manager, M. J. Hammers.

The A. C. Knapp Co. plant on Lafayette avenue, between East and Meldrum avenues, is being refitted and the manufacture of Abbott-Detroit cars by the new company has already commenced there.

The personnel of the Consolidated Car Co. is made up of men well known in the motor car trade. The president, R. A. Palmer, who will be active in the affairs of the company, is credited with the successful development of the Cartercar Co., having been general manager of that company for a period of about five years. He has also been identified with the General Motors Co. for a term of years as a prominent member of its managerial staff.

In Detroit, Palmer is well known through his connections with the Palmer-Bee Co. While A. C. Knapp, vice-pres-

ident of the new company, will not be active in the handling of the new business on account of his duties as president and general manager of the A. C. Knapp Co., his affiliations with the trade in the manufacture of automobile bodies are such as will add a considerable element of strength to the organization.

M. J. Hammers, general manager of the new company, has been in charge of the building and marketing of Abbott-Detroit cars for several years. He was formerly general manager of the Jacobson Machine Mfg. Co., manufacturer of motors and axles, and is still retained as director and consulting engineer of one of the large producers of that line in the Pittsburgh district.

The transfer of the property from the Abbott Motor Car Co. to the Consolidated Car Co. involved properties to the extent of approximately half a million dollars. E. F. Gerber, formerly principal stockholder in the Abbott Motor Car Co., will not be in any way connected with this new company and is retiring entirely from the Abbott business.

D. E. Perry, purchasing agent, and F. E. Sangbush, service manager of the Abbott Motor Car Co., will both be active in the new organization.

Plans have already been put into effect whereby the Consolidated Car Co. will handle the service business on Abbott-Detroit cars and maintain a selling organization, both of which are sure to create results satisfactory to users. The original Abbott-Detroit corporation of dealers throughout the country is maintained fully intact through these plans. These dealers have marketed over \$12,000,000 worth of Abbott-Detroit cars during the past four years.

Decision in Favor of Austin

A decision in favor of Walter S. Austin, of the Austin Automobile Co., Grand Rapids, Mich., against the Cadillac Motor Co., Detroit, was rendered January 8, in the suit of Austin against the Cadillac company, charging the latter with infringement of the two-speed axle which was used by the Cadillac company during 1914. District Judge C. W. Sessions has declared the Austin patent claims valid and also infringed and the decree will be entered granting an injunction and ordering an accounting. The plaintiff will recover costs. It is thought that the Cadillac company will appeal to a higher court. This suit for infringement was started in July, 1914, by Mr. Austin, who claimed that the Cadillac company had been infringing patent No. 1,091,618 issued to him March 31, 1914.

DETROIT SHOW TO HAVE LONG LIST OF PATRONS

Motor Capital's Trade Entering Into Project With Enthusiasm—Access- sory Men Are Numerously Represented

Sixty-two different makes of car will be shown at the 14th annual motor car show of the Detroit Automobile Dealers Association, which opens Saturday, January 16, in the two large buildings of the Detroit Lumber Co., West Jefferson avenue.

Of the 62 different makes of car now on the exhibitors' list, 55 are gasoline cars and 7 are electrics. Of the 55 gasoline cars, 36 are passenger cars and 19 are delivery cars or trucks. Of the 7 electrics, 6 are passenger models and the seventh a taxicab. The number of car manufacturers who will be represented will be 42, of which 35 make gasoline cars and 7 electrics. The list of exhibitors follows:

Passenger Cars

*Buick Motor Co.	Buick
Bomb-Robinson Co.	Hudson
Carter Co.	Cartercar
Cadillac Motor Car Co.	Cadillac
Cunningham Auto Co.	Maxwell
Ford Motor Co.	Ford
Graham Motor Co.	Hupmobile
Jackson Auto Co.	Jackson
McKaney-Derilyn Co.	Detroit, Haynes and Grant
Neumann-Lane Co.	Chalmers, Pierce-Arrow
Oldsmobile Co.	Oldsmobile
Oakland Motor Car Co.	Oakland
*Overland-Detroit Co.	Overland
Regal Motor Sales Co.	Regal
Siegel-Zeckendorf Co.	Pearless and Cole
J. P. Schneider	Locomobile, Premier
P. W. Schulte & Son	Paterson
*Studebaker Corp.	Studebaker
*Standard Auto Co.	Packard
*Westmore-Quinn Co.	Saxon, Paige-Detroit
Winton Motor Car Co.	Winton
*M. A. Young	Mitchell and Beo
King Motor Sales Co.	King
Chevrolet Motor Co.	Chevrolet and Monroe
Monarch Motor Car Co.	Monarch
Scripps-Booth Co.	Scripps-Booth
Princess Motor Car Co.	Princess
Postal Garage	Pullman

*Will also have commercial cars in the commercial vehicle section.

Commercial Vehicles

Thompson Auto Co.	Federal, Commerce, Standard
General Motors Truck Co.	G. M. C.
J. C. Willson Co.	Willson
Moritz-Muller Co.	Signal
Kelly-Springfield Motor Truck Co.	Kelly-Springfield
Thos. F. Cowhey	Garford
Denby Motor Truck Co.	Denby
Dominton Motor Truck Co.	Dominton
Republic Motor Truck Co.	Republic
International Harvester Co.	International

Electric Vehicles

Anderson Electric Car Co.	Detroit Electric
Ohio Electric Car Co.	Ohio
Storms Electric Car Co.	Storms
H. L. Walker Co.	Woods
Edward I. Rumsey	Millburn
Neumann-Lane Co.	Rauch & Lang
Detroit Taxicab Co.	Electric taxicab

Accessories

Sewell Cushion Wheel Co.	Chas. E. Miller, National Refining Co., Cleveland, O.; Automobile Supply Co., Wayne Oil Tank & Pump Co., Sears-Cross Co., Detroit Electric
Esco Mfg. Co.	W. McCookin
Esco Mfg. Co., B. B. Ford Co., Detroit Enclosed Body Co., Winslow Lubricating Co., Indian Refining Co., Auto Tire Exchange	
Master Carburetor Corp.	W. W. Taylor Co., Chicago, Ill.
Fidelity & Casualty Co.	Champion Spark Plug Co., Toledo, O.; Adolph Schreither, The Consolidated Mfg. Co., Toledo, O.
Edward Gray	General Ice Delivery Co., Holter & Clouse
Fred E. Holmes Co.	Columbia Buggy Co., McCormick Mfg. Co., Searlight Mfg. Co.

Lovell Heads the M. A. M.

F. Hallett Lovell, Jr., president and treasurer of the Lovell-McConnell Mfg.

Co., Newark, N. J., was elected president of the Motor and Accessory Manufacturers at a meeting of the Board of Directors held last Thursday in the association's offices. The other officers, all to serve one year, are: First vice-president, C. W. Stiger, Stromberg Motor Devices Co., Chicago; second vice-president, C. E. Thompson, Electric Welding Products Co., Cleveland; third vice-president, T. J. Wetzel, Dyneto Electric Co., New York city; treasurer, L. M. Wainwright, Diamond Chain & Mfg. Co., Indianapolis; secretary and assistant treasurer, Alfred P. Sloan, Jr., Hyatt Roller Bearing Co., Newark, N. J.

At the twelfth annual meeting of the M. & A. M., at the Waldorf-Astoria, Wednesday, E. H. Broadwell, Fisk Rubber Co.; Christian Girl, Perfection Spring Co., and E. W. Beach, Manufacturers Foundry Co., were elected to the Board of Directors for three years.

L. M. Wainwright was reelected to the Board of Directors for three years. The following named directors declared themselves unable to accept reelection: H. T. Dunn, Fisk Rubber Co.; F. G. Billings, Billings & Spencer Co., and E. S. Fretz, Light Mfg. & Foundry Co. William M. Sweet continues as manager.

Dort Organizes With \$500,000

The Dort Motor Car Co., which has just been organized in Flint, Mich., to make the Dort car, has been incorporated with a capital stock of \$500,000, of which \$400,000 is common and \$100,000 preferred and of which \$217,000 has been paid in.

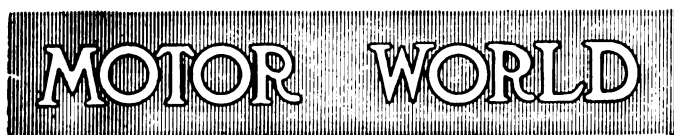
The officers of the company are: President, J. D. Dort; vice-president and general manager, D. M. Averill; secretary-treasurer, F. A. Aldrich; sales manager, J. D. Mansfield. These officers and George L. Simmons constitute the Board of Directors. Etienne Planche is chief engineer and designer.

The personnel of the officers and the board of directors is the same as that of the Durant-Dort Carriage Co., from which the motor car company has purchased a five-story building, 120 x 160 feet, fitted up with the necessary machinery and equipment to complete 40 cars per day.

At present two models, a touring car and a roadster, will be made, production beginning in February.

Trade Veteran Passes Away

Abram H. Esbenschade, for three years Milwaukee distributor of the Waverley electric, and previously for 30 years president of the Westphal File Co., died December 28, aged 61 years.



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\$'s Not No.'s

TALK dollars made, rather than the number of cars you sold, when you want to tell about the amount of business you have done during the year.

It is the dollars made that is the real indication of your business success during the year. The total number of cars sold may be quite meaningless; in fact, there are cases on record where the total number of cars sold is one of the poorest indications of the business success of the year; the majority of the sales meant a used-car deal, and on many of these used cars there was a real loss shown on the books.

Too often the dealer has not enough backbone to pass up a poor used-car deal when it would be money in his pocket if he did so. The bait of moving another new car is too strong. He cannot resist. He sells another car, takes in a used car at too much and is money out on the whole transaction. It would be better to let his rival across the street make a new sale and take in the old car at too high a figure. Make up your mind to it now that it is dollars made that amounts to more at the end of the year than number of cars sold.

Courage Required

It takes a real strong salesman to tell the customer who comes for a new car in part exchange for an old one that he will allow only so much for the used car, and who is quite content to see the customer go into the rival's salesroom across the street and get a higher allowance for the used car and drive off in a new one.

It may be an ordeal, but it is better business than to take the old one, lose money on it and cut the heart out of your profit on the new car. The rival across the street can continue in business only for a certain time and make such deals. The end of such a lane will soon come.

Ask a hundred different dealers as to the amount of business they have done in the past year and they immediately start telling about how many cars they have sold. Their story is fascinating. You are at once impressed with the amount of money they must have made, but the next minute you may be surprised to hear of small profits, to hear of the financial backer being dissatisfied, and to learn of the bank shortening its credit. And why all this big number of sales and these opposite indications? There is but one answer: doing business on the number of cars sold rather than on the amount of money made out of each transaction. It is better to lose a sale than to make one and lose money on it. Don't let the craze of numbers get possession of you; keep your eye on the total profits.

Success in Gotham

NEW YORK'S fifteenth annual motor car show must go down in history as a successful show; successful because the attendance exceeded that of all previous years, and successful because of the number of retail sales made as well as the number of agencies established. The show has already proven a good tonic to the depressed spirits of not a few dealers in the metropolitan area with its population approaching 8,000,000. It has demonstrated that the public is not yet bored with cars, the increased paid attendance being the surest proof that buyers are more interested than ever; and so long as New York can secure an attendance approaching that of last week so long should the show be continued on an increased scale, and so long should the dealers in the metropolitan area look forward to it as the greatest stimulator of business in the year.

Eight Meets Favor

The eight-cylinder motor was most favorably received, the increased number of exhibitors showing eights adding to the general interest that has been developed during the past autumn. Every maker is imbued with the thought that many more eights are coming on the market, and the majority of them are already resigned to the fact that they are face to face with a real testing period for eights and that come what may the next six months will largely demonstrate whether the eight is to remain a permanent factor in a small way or if it is going to assume dominating proportions. At present it is coming with a greater onrush than was ever experienced in the invading days of the six. In a few months it has taken the makers and the people by storm, and it looks dangerously like a stampede rather than the hoped-for slow introduction of it, an introduction such as the six received.

WIDE-AWAKE MERCHANDISING

SHOW PLANS FOR THE DEALER WHICH HELP BRING BUSINESS

Six Things Which Should Be Done If the Show is to Bring in a Commensurate Return—Study and Analyze the Whole Situation to Obtain Better Results

Many a dealer has closed the experiences of show week with a mind full of regrets over lost opportunities.

If details had only been arranged more carefully. If plans had only been more fully considered, more carefully matured, he feels that the story for him might have been entirely different. He was crowded and hustled into the show and the end of the show came with amazing rapidity only to find him without the definite progress hoped for and a whole string of things left undone.

But it is too late to do anything about it now and he is too busy to make written notes of the points for next year so that often he gains but little by the experience. It all seems very unsatisfactory, very unprofitable! But why?

A motor car show, whether it be in Chicago or in Joliet, is nothing more or less than an opportunity. The utilizing of the opportunity to fullest advantage means success. The neglect or failure to grasp and plan for this fact spells failure and mediocrity. So the dealer who desires to get something out of his show or opportunity must trust himself and rely on himself to make the opportunity worth all it should be worth.

FIRST — ANALYZE YOURSELF. What is it that you want to accomplish at this show? What is the target you are aiming at? Unless you can see this very plainly and very clearly in your mind you have a very poor chance of hitting the bullseye. So the first thing you must do is to see very clearly and distinctly what it is that you want this show to do for you. It isn't necessary

for you to talk about what you want to do but at least you must see it and know it and be able to write it down or else you haven't the least chance in the world of doing it.

SECOND — STUDY THE POSSIBILITIES OF THE SHOW. What are the opportunities it offers? Who will be there? What are you going to do to see that those whom you desire to be there are there? What are you going to do with them when you get them there? What do you want them to do? When do you want them to do it? How have you planned to get them to do it? What dealers will you have coming? What do you want them to do? What can you do to attract attention to your booth or exhibit before the show? In other words, what can you do to get people thinking as much about your particular exhibit and the desirability of seeing it as of seeing the show as a whole? Worth thinking and planning for, is it not?

THIRD — STUDY YOUR SALESMEN. HELP THEM PLAN. If you have a vision of what you want you will be able to direct and guide them so that you will accomplish it. The secret of efficiency is preparedness. Edward Earle Purinton says, "EFFICIENCY IS THE POWER OF DOING ONE'S MOST AND BEST, IN THE SHORTEST TIME AND EASIEST WAY, TO THE SATISFACTION OF ALL CONCERNED." Preparedness means knowing this and knowing how to do one's best. If you haven't got this figured out sit down with your salesmen and get

your best ideas down in black and white.

The best strategists are the ones who have their plans all down in black and white, have their maps drawn, and all possible information at hand. They may never use the plans, but at least they have the knowledge and power that comes from having mapped out the situation.

This show is a fight for business, a battle for business supremacy, a short, sharp engagement in which the most carefully laid plans will often defeat superior forces! Your salesmen must be one of your chief considerations. They are your army. Upon their disposition depends the success of your plans. They must be on duty every hour of the show. They must be keen, alert, trustworthy and have explicit instructions with authority to use their good judgment in a critical moment.

FOURTH — STUDY YOUR EXHIBIT SPACE. Plan the most effective arrangement of cars and decorations. See that you have materials for writing letters, making notes, storing catalogs and getting them from the show back to your office. What have you in the way of special literature for the show?

FIFTH — STUDY YOUR ADVERTISING. What do you want it to do for you? Is it planned to accomplish this result? What space are you going to use? How many papers? What are you going to say? What have you in mind for publicity notices? There is room here for much thought and much planning.

SIXTH — ARRANGE YOUR IDEAS INTO A COHERENT PLAN. THEN CARRY THEM OUT.

There will be other points not suggested here. There are conditions peculiar to your locality and your show. These can be dealt with and foreseen only by someone on the spot. These thoughts, however, may lead you to a more comprehensive planning for the oncoming show. And better planning will lead surely and certainly to more profitable results. And results are what you want from the show.

SHOW METHODS FOR SALESMEN THAT RAISE BATTING AVERAGE

He Should First Really Understand Why He Is There—The Reason Is Not Because the Boss Sent Him—He Is There to Sell and Should Make Study of Self and Tactics

A salesman should know **why** he is at the show.

There should be nothing indefinite or half-understood in his mind as to the reason **why** he is there. And it is strictly up to his employer to give him a clear vision and a clear reason. The salesman is not at the show to see the parade, nor even to see the competing cars; nor should he waste much time listening to his competitors' arguments. He is there first, last and all the time to do TWO things: First, to make SALES. Second, to get the name and address of every prospect who appears interested.

Let no salesman deceive himself with the idea that a show is no place to make sales. That is exactly what it is for. It is not a social institution, but a business promoting function. The public by the thousands may wander up and down the aisles and have no thought of buying. That does not alter the fact that the show presents a wonderful selling opportunity for the dealer who plans to use it as such.

Buyers Don't Fear You

Among the thousands of lookers are some BUYERS. And they are coming to your booth. They will ask few questions, perhaps; and they may ask for little literature, but the REAL SALESMAN will sense their presence instantly.

And there will be some BUYERS who come because you have invited them to come. And they will stop at your place and they know that you asked them there because you want to sell them your car. They don't **fear** you because of that. The fact that they come and show themselves at your booth indicates that they are almost persuaded.

How are you going to handle such a one? Are you going to talk weather, show, or something equally irrelevant, or are you going to get right down to business and try and make a sale then and there? Oh, it isn't necessary to make yourself obnoxious; not at all. But once you get it through your head that this prospect knows you are a **salesman** and knows that you are after business, you

will realize that he will respect you all the more because you get right after him to close.

Don't try to pretend that you are at the show simply because the boss told you to go there. Don't carry in your head the idea that the boss just went into the show because everyone else did. He went into it because it is a business opportunity. He will cash in on it only in proportion as you feel the opportunity and help him to cash in on it by using it.

Started With Determination

One Detroit salesman who does not let the grass grow under his feet went to the show last year determined to make it yield visible results. He had heard all the talk about the show being a dull grind, etc., but he made up his mind that it was a great opportunity to close sales. It was a hard week for him. There isn't any doubt about that.

But he closed eleven sales and got the CASH for SIX of them right on the spot!

And every one of the sales was a CLEAN sale. No trade-ins and no discounts.

Some of the sales were made to people he had never seen before. But most of them were made to prospects whom he had invited to the show. He knew them when they came in. He showed them his car and virtually sold it to them. If any one of them had doubts he was urged to go and look the others over and then "Meet me back here and tell me what you think of them."

Injecting Confidence

That kind of talk puts the kibosh on fear. It injects confidence into the prospect. It is perfectly logical for the prospect to argue to himself that "if that salesman wasn't dead sure he would never let me get away, etc." And so he comes back. And the live salesmen make the sales. They always do. They go to the shows to make sales. What are **you** going for, Mr. Salesman?

Of course there will be some, indeed

a great many, whom you cannot sell on the spot. But if you cannot make the sale you can at least get the name. It's business. That's what you are there for. Are you big enough for the job?

Unless you get the name of the prospect you are not doing your part. The chances of his coming down to your place of business to see you are very remote. He appears interested. Why should you be afraid to ask his name?

In the old days the salesman used to sneak off to the bar or cafe with his customer and in the course of conversation the desired facts would come forth. But there are no cafes and bars used in modern automobile salesmanship. It's a regular business, as clean and as competitive as any business. Brains and values triumph. And the salesman who asks for the name of a prospect is a much better man than the fellow who says to himself, "Oh, I'll run across that fellow again some day," and lets it go at that.

The salesman who goes to the National show in New York or the salesman who attends the local show at home should have the same purposes, the same ideas, viz.: To make sales and to get names of new prospects. Your success will be measured by your ability to make good on these two points.

WINTER BUSINESS HELPED BY TRADES

Detroit Dealer Adopts Original Method to Accelerate January Business

During December and January it is often very difficult to close sales. There is observed a marked tendency to put-off on the part of the average buyer, and especially is this noted where the man has a car to trade in on the new machine. To get quick action in cases of this kind the Wetmore-Quinn Co., of Detroit, adopted the following plan, which works successfully.

When the buyer reaches the point where he wishes to delay, the salesman comes right down to brass tacks and says something like this: "We will allow you so much for your car **today**, your new car to be delivered April first—you to deliver your car to us now." The plan works like a charm and gives the Wetmore-Quinn company two or three months in which to dispose of the used car. "If we dispose of the used car any time after it is delivered to us we have the use of the money as a deposit until the new car is delivered," says Quinn.

HERSCHELL-SPILLMAN EIGHT HAS STAGGERED CYLINDERS

**Yoke Construction Is Avoided and Each
Connecting Rod Has Its Own
Crank Pin—One Camshaft
and 16 Cams**

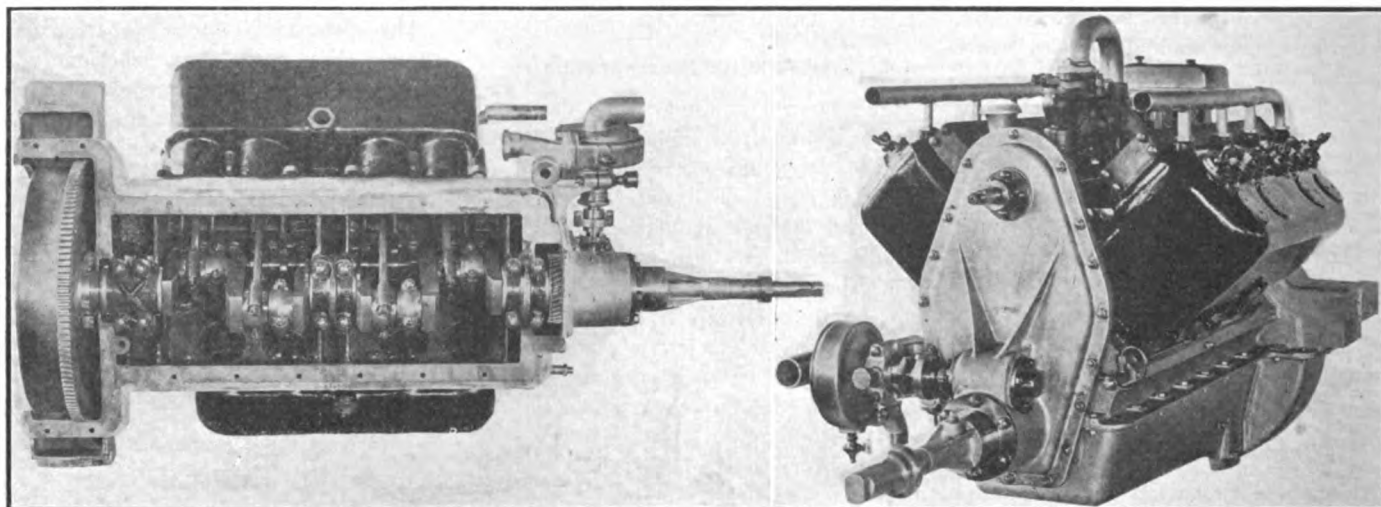
The latest eight-cylinder motor to be announced is that recently developed by the Herschell-Spillman Co., North Tonawanda, N. Y. This latest eight is a conventional V-type with two-block cylinders mounted at 90 degrees and having intake and exhaust valves on the one side so that a single camshaft within the crankcase serves for both sets of valves. The motor has cylinders 3 x 5, giving an S. A. E. rating of 28.4 horsepower, but it has shown 48 horsepower at 1,000 r. p. m.

mately 213 pounds less. With complete aluminum crankcase the weight is 550 pounds and with cast-iron crankcase 660 pounds.

The general layout of the motor does not deviate far from the conventional. In the V between the cylinder blocks the carburetor is located in front and mounted sufficiently high to leave the valves accessible. At the rear is the battery coil ignition system, the illustration showing the Delco equipment, combining ignition, starting and lighting. In front is a short transverse shaft carrying the double water pump on the left, but when separate systems are used the generator can be driven from the opposite end of this cross shaft and the starter-motor located under the left side cylinder and bolted to the rear of the crankcase, driving by pinion to the steel gear ring bolted to the flywheel. In such a case the starter pinion can be controlled manually, electro-magnetically

to keep the temperature the same at all four exhaust valves. In the cylinder casting each cylinder bore is entirely surrounded by water, there being $\frac{1}{2}$ inch jacket space between the first and second and third and fourth cylinder bores. Intake and exhaust valve seatings are entirely surrounded by water and the jackets extend to a point $\frac{1}{2}$ inch below the top of the piston when at the bottom of its stroke.

The oiling system is by pressure without splash in the crankcase and with the oil pressure regulated between a minimum of 10 and a maximum of 40 pounds. The gear pump is located in the crankcase well on the bottom of a vertical shaft which takes its drive through 45 degree spirals from the camshaft. Oil is delivered through a longitudinal hole in the crankcase extending from front to rear and thence by three branches to the three bearings of the crankshaft and camshaft. The crankshaft is drilled with



The view at the left shows the leading characteristic of the Herschell-Spillman eight. Each connecting rod works on an individual crankpin instead of two rods working on each of four pins. To accomplish this the cylinders are slightly staggered. This also permits a 16-cam camshaft so that each valve has its own cam and timing is facilitated

The motor differs from others in several features, the most important being that the yoke end connecting rod is not used, but the connecting rods for opposite cylinders are standard I-beam types which fit side by side on the crank pin, two connecting rods attaching on each crank pin. This feature of design means that the four cylinders constituting one block are not directly opposite to the four forming the other block, but are staggered slightly, so that the cylinder block on the left is $1\frac{9}{16}$ inch forward of the block on the right. This arrangement permits a camshaft with 16 cams instead of 8 cams. Using separate cams allows of any variation in timing. No effort has been made to reduce weight, but as compared with a six-cylinder of the same piston displacement it weighs approxi-

or by the Bendix drive. The camshaft lies in the top of the crankcase directly above the crankshaft and is driven by spiral gears. Directly above the camshaft is the shaft driving the ignition system, also driven by spiral spur gear.

Particular attention has been given to water circulation, which is maintained by double centrifugal pump, one portion maintaining circulation in one cylinder block and the other in the opposite block. The pump has two discharges and separate pipes connect with each cylinder block. The return water circuit is taken at four points out of each cylinder block, these openings being opposite each exhaust valve, and the size of these openings has been determined experimentally with the thought of maintaining constant temperature at all four openings in order

$\frac{1}{4}$ -inch opening and the oil delivered by centrifugal force to the lower connecting rod bearings and thence through a steel tube attached to the connecting rod; it reaches the wrist-pin bushing through a hole on the top, the oil being thus fed on the slack side of the wrist-pin journal. A blow-off valve allows of the discharge of oil to the timing gears at front, which are submerged well above the cross shaft, the overflow from these finding its way back into the crankcase. At 1,000 r. p. m. the oil pressure is 18 pounds.

Valve actuation is one of the delicate matters of an eight and extreme accuracy must be kept in mind. The camshaft operates each lifter rod through a short lever, one end of which is hinged and the other bearing upon the lower end of the valve lifter rod.

Some of the Things the Show Taught Reilly

He Is Observing In New York's Big Exhibition and Plans to Make His Observations Better His Own Exhibit

By Ray W. Sherman

REILLY had been to the New York show and had just got back—and that's about all. He had removed most of the dust and grime from his ears and had fired that new pair of shoes into the closet out of revenge for the way they pinched his toes.

In his old shoes, everyday clothes and ordinary Callawassa disposition he was back at his desk, once more in the midst of business—and glad of it. His pile of mail never looked so big—or so welcome—as when he put his overcoat on the hook and settled down.

"Well! How Was the Show?"

"Well," said Tommy Trumbull, "how was it?" Tommy added his coat to the office's assortment of garments.

"Fine, Tommy! Fine!"

"Well, well!" greeted Charley McGrain, who had been general manager in the absence of the boss. He, too, gave one of those welcome-home-old-tops as he made his morning entree.

Reilly leaned back in his chair and turned part way around. "It was some show!" he vouchsafed.

"Good?" asked Tommy.

"So I heard," remarked Charley.

"It sure does do a man good, too, to get away from business and go to one of these shows. It helps even if it doesn't do anything but shake a man out of the rut. I think I'll take Tommy to the Chicago show; it would do him a lot of good."

"This isn't like Pa taking the boy to the circus, is it?" smiled Charley.

Reilly laughed, but Tommy glared at Charley. Any man who attempted to throw cold water on his trip to Chicago should be shot, according to this tyro salesman's opinion.

The Plan Appeals to Tommy

"That'll be fine!" Tommy exclaimed. "I'd love to go!"

"Pack your grip the——" Reilly looked at the calendar "——the twenty-fourth. We'll go Sunday night."

"Sorehead!" said Tommy under his breath to Charley.

Reilly had visited the show with a truly discerning eye and he just had to

get some of it out of his system. "There is a big education in a show," he began. "You can get a slant on things there that you never would get anywhere else in a million years. The general conception of a show is that it is a place to look over all the makes of car, but to me it is also an opportunity to study different kinds of salesmanship and to see how other people do business. It is a help in staging our exhibit at our own show here in Callawassa, and I consider the trip worth all it costs. If taking Tommy to the Chicago show would help his sell one more car next year wouldn't it be worth what it costs?"

"Yes, it certainly would," agreed Charley, and Tommy smiled his acquiescence.

Find All Kinds of Salesmen

"Just as in our local show, you will find all the breeds of salesmanship in the big shows that exist. And many types of business methods are exemplified. You don't have to go to a small show like we have in Callawassa to find not over-aggressive salesmanship and merchandising; you can find it everywhere.

"I have always maintained that we are foolish to pay good money for space at a show and not make the most of it; it is just the same as paying good money for a Main street show window and then sub-letting it at ruinously low rates to spiders and houseflies. The man who takes space at a show often does it because it is the usual thing to do; just why he does it he doesn't know."

"That's right," agreed Tommy, anxious to retain his grip on that Chicago trip.

"After a dealer has taken space he ought to plan his exhibit before he ever gets a car inside the building. The way some exhibits are laid out shows lack of sufficient planning or judgment. There were some well-staged exhibits at the New York show. They show ability on the part of somebody. And there were others not so good.

Plan Before Staging Exhibit

"Before we stage another exhibit we're going to do some fine planning; I read in one of the trade papers about a year ago of how a Boston dealer mapped out

the whole business in his office before he ever put a car in the show building."

"How do you mean?" asked Tommy.

"Like this." Reilly drew a diagram of an imaginary show space on a piece of letter paper, found four cards in his desk and continued. "This, you see, is the space; it should be drawn on an accurate scale, an inch to a foot, for instance. The cards represent cars and the cutaway motor, our table, chairs and other exhibit paraphernalia. They also should be to scale.

Move Cars Around on Paper

"Then you do this." Reilly began shifting them around. "You place the cars and other things in positions of greatest advantage. The closed cars, of course, ordinarily go at the back so they will not hide the touring cars and runabouts, and a little imagination helps you to see just how the whole business will look. Now here is one great advantage.

"You undoubtedly have noticed that in some exhibits there is not enough room between cars. By this method you can tell just how much room there will be everywhere. If your arrangement on this chart shows there isn't going to be enough room in certain spaces with the arrangement you had in mind, you simply move everything around again and keep at it until you get things just where they will fit best."

"That's a lot better than shifting half a dozen cars around," commented Charley over Reilly's shoulder.

Reilly Favors the Lecturer

"I should say!" agreed Tommy.

"Another thing I'm strong for is a lecturer," added Reilly, pushing the chart to one side. "At New York there were several of them and they made hits. Here we get to work and put a sectional motor in our exhibit and say to people, 'Look what we've got! A sectional motor!' They look—and that's all. They don't know anything about it!

"If that motor exhibit is to be of value to us we should have some one there to explain to the public what it is and why we are showing it. We should call attention to our small, high-speed fea-

tures and make the story intelligible to the layman. I think you could do that, Tommy, with a little training. Eh?"

"I'd like to try it," enthused the youth.

"Of course, you would have to soak up a little technical data and make yourself pretty well posted, but I think you could do it with little difficulty. It wouldn't be a bad plan then to take the party of visitors from the motor to each of the cars and explain the features of each one. Take them all around just the same as a spieler does in a sideshow."

Would Have to Try Out Plan

"It sounds good," said Charley.

"I don't know just how this taking them all through the exhibit would work out," continued Reilly. "I don't know whether it would interfere with the work of the rest of us salesmen or not; we could tell by trying, however."

"And here is one other little thing. You go into a lot of exhibits and see very pretty enclosed cars. There they stand, with the doors shut like ice-boxes! I think the doors should be left open so the visitor can see inside. The inside of an enclosed car is one of its principal selling points, so why not show it? Make it stick out where the visitor can't help seeing it."

"That's my theory, too," replied Charley.

Salesmen or Decorations?

Reilly jammed a match down several times on the sandpaper of the match box and finally drew a light. "I really was surprised in some of the New York exhibits," he puffed, "at the salesmanship in one or two of the spaces. There were salesmen enough there, but they didn't seem to be doing much except including themselves in the decorative scheme. Salesmen cost money and decorations are darned cheap in comparison. If it is merely a question of decorating the exhibit I think it is much better to buy a few fixtures and leave the salesmen in the showroom."

The Old Way and the New

"I walked into one or two of the exhibits, looked the cars all over and walked out again. No one even so much as said How-dy-do. There were salesmen there, but they seemed to think that it was my duty to go to them and ask them questions if I wanted to know anything. They couldn't see their way to coming to me. And that—," Reilly thumped the deck, "—exemplifies the old and new way of running a show."

"It has been too much of an exhibit and not enough selling business. The

exhibitors have been prone to set the goods up for people to look at and then quit; the up-to-date way is to set the goods up and then organize your whole business before and after and from top to bottom with the one idea of making a profitable connection between the public and that exhibit. It is the order taker versus the salesman."

Never So Good Can't Be Better

"I don't mean that you boys have been remiss in this work; I consider that we have always had one of the best and most profitable exhibits at our Callawassa shows, but I do mean that we are never so good that we can't be better and that some of our contemporaries have a long way to go yet before they get to Tipperary; their hearts aren't even there—and they've got to be before very much begins to happen."

"In another exhibit I was talking to a salesman and another salesman came over and asked a question of the man who was talking to me. My man stopped talking to me and started in on some sort of confidential confab with his friend. Just as I was walking out he made a false start to come after me but changed his mind and went back. It didn't seem to worry him much."

Should Be Real Teamwork

"Maybe he had you spotted for an inquisitive dealer," Charley suggested.

"Not he!" exclaimed Reilly. "Not he! I could tell by the look on his face when he saw me going. There should be better organization than that in a show squad; when a salesman is talking to a visitor let him alone unless there is some good reason for butting in."

"Why not give each salesman a definite job?" said Tommy, who had an idea.

"That's the way it should be," replied Reilly. "I know of one dealer who assigns a man to each car in the exhibit and has a couple of men who are salesmen-at-large. They float around and help out where they are needed. They are good closers and will step in, too, and help a young salesman who thinks he has got somewhere near the closing point and can't push it over. They also keep an eye open, and if too many visitors descend on one car will step in and help out that man. It is teamwork of that sort that counts."

Sometimes Salesmen Are Few

"It must be fine!" beamed Tommy.

"Of course, some dealers don't have enough salesmen to distribute that way, but in many cases there are salesmen down from the factory or subdealers in

from the outlying towns who might be induced to cooperate in such a scheme and help the work along. And even if there are not men enough to assign one to each car the work could be so divided that there would at least be a definite understanding which would result in co-operation and more effective effort."

"Is the Chicago show as good as the New York show?" Tommy looked as if he were really seeking information.

"Chicago's a good show," said Reilly, and Charley gave Tommy a look which said, "What are you trying to do? Kid him along?" But Tommy merely returned the glance with a glare which said, "Mind your own business!"

Injunction Denied in Horn Suit

Judge Hand has denied the motion for a preliminary injunction made by Gottfried Piel and the G. Piel Co. in a suit in New York against the Stewart-Warner Speedometer Corp. of New York and the Stewart-Warner Speedometer Corp. of Virginia, involving alleged infringement of the Long hand horn patent No. 1,090,080. Judge Hand states, in his opinion:

"Whatever may be said of the patentability of the device, as disclosed, clearly it cannot be thought to cover the defendants' device if the claims are to remain valid. . . ."

Tire Core Patent Held Invalid

Tire core patent No. 865,064, covering a collapsible core to be used in the building up of a tire, after which it may be easily removed, has been declared invalid.

The patent, which was granted September 3, 1907, to W. C. State, was taken over by the Goodyear Tire & Rubber Co., which brought suit against the Hood Rubber Co. in Boston, claiming infringement.

The Goodyear company claimed in its suit that the State patent covered all types of cores used in the manufacture of detachable tires, having substantially non-extensible edges and comprising a plurality of independent sections held in ring formation by one or more rings overlapping the inner portions of the sections.

The decision, which was rendered by Judge Dodge in the United States district court for the district of Massachusetts, stated that prior to the invention of this core by State substantially the same construction had been in commercial use at several other tire making plants, in the manufacture of detachable tires, having substantially non-extensible edges.

Engineers Recommend Five New Standards

Reduce Tire Sizes From 50 to 9 Regular and 9 Oversize— Standardize Side-Outlet Carbureter

WITH the recommendations of five of its Standards Committee Divisions adopted as standard practice, and much of a helpful nature brought out in the dozen or more papers which were read and discussed, the Society of Automobile Engineers accomplished at its regular winter session, which was brought to a close after three days of hard work on January 8, net results which cannot fail to be of direct advantage not only to the engineering fraternity of the automobile industry but to the dealer, the garageman and the repair-shop operator as well. The sessions were all held in the auditorium of the Engineering Society's building, 29 West 39th street, New York city, the opening session being held January 6.

Benefiting the Dealer

Although the direct benefit of the work of the society to those not intimately connected with engineering problems of the industry may not be altogether plain to the dealer, one example of the work accomplished at this meeting will serve to make it plain.

The number of standard sizes for pleasure vehicle tires was reduced from more than 50 to 9 regular sizes and 9 oversizes. This means, briefly, that the dealer in tires need stock only those sizes which now have been adopted as standard by the S. A. E.; it will no longer be necessary for him to make provision for storing the 50-odd sizes which heretofore have taken up much room in his place of business.

Standard Carbureter Fittings

Similarly the society has materially assisted the dealer and the repairman in fitting carbureters by standardizing the size and shape of flanges, the latest work being the standardizing of carbureter fittings, such as fuel intake pipes, unions, etc. Furthermore, the dimensions of yoke and rod-end pins now are standard and the dealer can order these parts in standard sizes with the assurance that they will fit. Also, new screw thread sizes have been adopted, thus reducing the amount of stock which the dealer must carry.

Quite as important is the work that the society has been doing along lines which are more purely engineering. For example, it has standardized the radius of the curvature in car frames and is

considering standardizing the amount and method of arranging the drop; it has standardized specifications for steels so that a maker may be sure of getting exactly the proper material for the pur-

WHAT THE STANDARDS COMMITTEE RECOMMENDED

DIVISION	
Carbureter Fittings	Recommended present standard horizontal flange dimensions and contour with bolts in vertical plane for carbureters of side-outlet type; bore of union nut increased from .002 to .005 inch. Added $\frac{3}{4}$ - and $\frac{1}{4}$ -inch standard flared tube unions and fittings.
Electric Vehicle	Speed ratings to be based on continuous operation with half-load on hard, smooth, level roads at average battery voltage. Mileage ratings to be based on rated 5-hour discharge capacity of battery and a continuous run with half-load over same roads. Recommends adoption of two classes of motors, one series 80-85 volt, the other 60-66 volt and that motors carry nameplate giving maker's name, type of winding, frame size, volts, amperes, revolutions per minute.
Pleasure Car Wheels	Reduced tire sizes from 50 or more to 9 regular and 9 over-size, as follows: Regular—30 x 3, 30 x $3\frac{1}{2}$, 32 x 3, 32 x $3\frac{1}{2}$, 34 x 4, 34 x $4\frac{1}{2}$, 36 x 5, 36 x $5\frac{1}{2}$, and 38 x $5\frac{1}{2}$. Over-size—31 x $3\frac{1}{2}$, 31 x 4, 33 x $3\frac{1}{2}$, 33 x 4, 35 x $4\frac{1}{2}$, 35 x 7, 37 x $5\frac{1}{2}$, 37 x 6, 39 x 6.
Miscellaneous	Standardized dimensions for yoke and rod-end pins. Adopted following standard diameters and pitches for screw threads: Coarse, beginning at $1\frac{1}{4}$ -inch and advancing by $\frac{1}{8}$ -inch increments to $2\frac{7}{8}$ inch inclusive, 12 threads per inch; beginning at 3-inch, and advancing by same increment to $5\frac{1}{4}$ -inch inclusive, 10 threads per inch; beginning at 6-inch and advancing by same increment up, 8 threads per inch. Fine: beginning at $1\frac{1}{4}$ -inch and advancing by same increment up, 16 threads per inch. All threads to be U. S. standard form. Also considering standardizing fan belt widths.
Frame Sections	Standardized radius of the curvature in frames and considered the amount and method of arranging the drop.
Iron and Steel	Adopted curves of the physical characteristics of carbon steel; S. A. E. specifications for chrome-nickel steel altered in chromium percentage and two silico-manganese spring steels recommended in place of one, allowing greater freedom in the silicon and manganese fractions.
Springs	Following names, descriptive of cantilever springs adopted: a, one-quarter-elliptic cantilever; b, half-elliptic cantilever; c, double-one-quarter-elliptic cantilever. Standardized eye bushing and bolt tolerances, offset of center bolts, spring clip nuts, center bolts, center bolt nuts and spring widths.
Commercial Car Wheels	Progress; proposed to increase felloe band thickness on 4- and 6-inch single and dual tires for trucks.
Lock Washers	Propose to add to present standards, after consultation with users, standard lock washer sizes for Nos. 6, 8, 10, 12 and 14 machine screws.
Electrical Equipment	No action taken on definition of "Glaring" light; recommended that lamp bulb bases and connector plugs be made interchangeable in same sockets; that "two-wire" and "single-wire" systems be termed, respectively, "insulated return" and "grounded return"; that conduit ends exposed to weather point downward; that metal conduit when led to a connector be soldered or clamped to the plug inside or outside a sleeve not less than $\frac{1}{4}$ -inch long; that fuses be of the enclosed type, marked with their rating, and having the following standard dimensions: $1\frac{1}{4}$ inches long with $\frac{1}{4}$ -inch ferrule or $1\frac{1}{2}$ inches long with $13/32$ -inch ferrule; that 10-, 20- and 30-ampere fuses be used; that fuse rating and temperature rise conform to National Board of Fire Underwriters' specifications.
Research	Progress; division is working on horsepower taxation formula but will do nothing until United States government report on same subject is available. It is desired that the formula include motor capacity, number of cylinders, tires, wheels, gear ratio, horsepower, speed, non-skid devices and other factors which may cause road destruction.

pose for which he intends it; it has standardized the names under which the various forms of cantilever springs are known so that there may be no confusion in designating them; it has standardized the diameters, thickness and material of lock washers and proposes to add further standard sizes for small machine screws; it is now working on a horsepower taxation formula which will be fair in that it will take into consideration all of the factors which have any bearing on road destruction.

Making Haste Slowly

These are but some of the things that the society has been doing during the past year. Not every standards report was accepted as recommended practice, for it is the policy of the society to make haste slowly and to investigate thoroughly before it places its stamp of approval on the work of its committees.

Heretofore the work of the society has been largely done at two semi-annual meetings, one held in the Summer and the other in the Winter; but if the wishes of a number of influential members are carried into effect it is likely that the constitution will be altered to provide for but one annual meeting instead of two. Also it seems likely that the meeting will be held in the Summer rather than during the show, for it has been found that it is difficult to obtain a quorum with the drawing power of the show to attract members from out of town. In fact, it was impossible to obtain a quorum in order to vote on the proposition of so altering the constitution.

Vote for Summer Cruise

As the result of a mail vote it has been decided to hold the next Summer meeting some time in June on one of the floating palaces that ply the Great Lakes. The majority in favor of both the time and the place for the meeting was large. It remains a question whether the society will be represented in the Engineers' Congress to be held in connection with the Panama-Pacific Exposition.

The report of the treasurer reveals that the society is in excellent financial standing, the total receipts being approximately \$21,000 as against expenditures of about \$16,000. Since the last meeting 32 members, 23 associates, 6 juniors, 1 affiliate, 5 affiliate representatives and 11 student members have been added.

In place of the usual annual banquet, which has become an event, there were two informal suppers, which broke the monotony of the professional sessions, the banquet being omitted.

POINTS REVEALED BY STANDARDS REPORTS

Of all the various reports which were placed before the society for consideration, that which dealt with the standardization of tire sizes brought forth the most enlightening discussion. This was brought about by a paper by C. B. Whitely, secretary and manager of the Hartford Rubber Works Co. E. R. Hall, the Goodyear experimental engineer, stated that one tire company has suggested calipers designed for determining the minimum allowable inflation. Ferdinand Jehle, Detroit, brought up the increase of pressure due to heat, and Hall said that for ordinary purposes the heating effect was negligible.

Under-Inflation Prevails

In discussing the prevalence of under-inflation among owner-driven cars, it was stated that one company tested 250 tires one night in a garage and found an under-inflation of 26 per cent, most of them in 37 x 5 and 34 x 4 tires. F. E. Moskovics, of Nordyke & Marmon, as a reason for this, said in three cities while touring last summer he was unable to obtain sufficient pressure at the tire companies' branches to inflate a 37 x 5 tire properly.

Referring to cord tires, Hall said they were designed to give a very small ground contact and thus keep down the wear and increase the efficiency, but to do this they must be blown up hard. Jehle said it was to be hoped that tire makers would not permit car makers

to equip with anything but the regular sizes of tires.

In presenting the report of the Research Division, Professor David L. Gallup offered as the consensus of opinion of the members of the division that the expense of the work necessary in drawing up a horsepower taxation formula would be unwarranted, particularly in view of the fact that the government now is working along the same lines. The report of the government investigation will be available to the S. A. E., but until such time as it is published the matter will remain in abeyance.

Advocate Ground Switch

In the report of the Electrical Division, which was read by Joseph Bijur, of the Bijur Motor Lighting Co., it was recommended, among other things, that a switch on the positive side of the battery be used for ground connection. By questioning, Albion D. Libby, engineer of the Splittorf Electrical Co., brought out the fact that the purpose of such a switch is to permit breaking the ground circuit where the ground is not detachable, so as to avoid the possibility of short circuits when repairs are being made.

Following the reading of the report of the Frame Sections Division, William Guy Wall, engineer of the National Motor Vehicle Co., drew attention to the fact that no account had been taken of the double drop frame and recommended that it be studied. K. W. Zimmerschied suggested that spring suspension is an important factor in the choice of frame sections.

BRIEF DIGEST OF PAPERS AND DISCUSSION

All told, some 13 papers were read and discussed at the various professional sessions, and among them a paper entitled "Automobile Bodies," by H. Jay Hayes, revealed much of an enlightening nature.

Hayes brought out the fact that although an all-metal body on a steam runabout which was exhibited at the Washington Park Automobile Show in Chicago in 1899 and which had been stored in a basement for 12 years, proved to be in good condition when examined, sheet steel rusts more quickly now than formerly because of the increase of carbon and manganese used to obtain a smooth finish. Sheet metal bodies, he said, do not require one-third the amount of paint required by wood bodies. In the small quantities used in 1900 metal bodies were more expensive than wood bodies. Later, when composite bodies consisting of a wood framework covered with sheet aluminum were developed,

this type predominated for the higher-priced cars. These bodies are superior to wood bodies owing to the scarcity of suitable wood and the tendency of wood to check and crack.

In the discussion which followed the paper, K. W. Zimmerschied, metallurgist of the General Motors Co., brought out as the reason for the use of wood frames the fact that body designers must change their body lines frequently to follow the dictates of fashion. Joseph Anglada brought out the fact that 2,800 to 3,000 bodies have been completed in which an all-steel construction is used with connection to a sub-frame, the bodies being made in three pieces. Zimmerschied offered as his opinion that the all-metal body is the body of the future.

In a paper entitled "Manufacture of Worm Gearing By a New Process," Cornelius T. Myers described in detail a particular process of producing worm

gearing. The straight type and the hour-glass type were described, together with the difficulties of assembling and adjusting them, and Myers offered as his opinion that the straight type, requiring alignment in only two planes, and therefore permitting of more accurate manufacture, is superior for general purposes to the hour-glass type.

Eight-Cylinder Rail Car

Henri G. Chatain described in considerable detail, in his paper entitled "An Eight-Cylinder Motor," a heavy four-cycle engine developed for railway motor car use in a car carrying 50 passengers and having a baggage compartment and capable of maintaining a maximum speed of 50 miles an hour on level track. This motor, as well as two others which followed it, were of the accepted V-form.

Edward R. Hewitt, engineer of the International Motors Co., opened the discussion by asking if oiling difficulties developed as a result of the force of gravity and the throw of the connecting rods tending to keep the oil on one side of the cylinders. Chatain stated that trouble of this kind did develop but that it had been overcome by properly timing the oil impulses.

Champions Wire Wheel

There were two papers on wire wheels and wood wheels, George W. Houk taking the side of the wire wheel makers and R. B. Mudge championing the wood wheel. Houk's paper treated in detail of the result obtained from a comparative test of wood and wire wheels, the wheels being of the same size and having similar rims. The tests showed that there was less deflection in the wire wheel than in the wood wheel and less permanent set in all cases. No actual results were given regarding the relative tire wear on wood and wire wheels.

Wood Wheel More Resilient

In his paper, Mudge attributed the origin of the wire wheel to the necessity for something that would give better service than the wood wheel which was manufactured abroad. The wood available abroad was inferior in quality and not suited for the purpose and the proper treatment and assembling necessary for good results were not understood abroad as was the case in America. Mudge stated that the wood wheel is more resilient than the wire wheel and that in the wire wheel the load is taken by the upper half, the lower half offering no resistance to flattening of the rim except that offered by the stiffness of the rim itself.

In conclusion, a table showing the percentage of wood, wire, and steel wheels manufactured in different countries is given.

In "The Practical Testing of Motor Vehicles," A. B. Browne and E. H. Lockwood dealt with the determination of the actual performance of a car as a whole, and also, with a method of block testing from which results reproducible on the road can be obtained. The paper was brought to a conclusion with a strenuous protest against the use of what is known as "horsepower" as a unit of motor car rating and the suggestion that cars be rated according to drawbar pull instead.

Advocates Signal Tests

Alden L. McMurtry read an illuminating paper entitled "Automobile Warning Signals," in which he laid stress on the necessity for still greater attention being paid to the production of adequate warning signals as a matter of public safety. Following a resume of the history of the earlier types of signals, McMurtry analyzed the requirements of a signal and lead up to the assertion that as much research has been done upon the power-operated diaphragm horn as upon any other single feature of motor car construction. After examining with the aid of charts the action of a diaphragm, the importance of scientific development was emphasized and it was pointed out that the tests of signals should be based upon the number of short sounds which can be obtained without adjustment, not on the duration of a single signal. A suitable basis for a uniform code of warning signals was proposed, distinguishing between danger signals and signals of intention.

Following the paper, some statistics gathered at the New York show were offered. These demonstrated that of 217 cars exhibited, 189 had the warning signal under the hood, 22 at the side of the car, and 6 in front. Of these, 211 were electric, 5 bulb, and 1 hand-operated. With regard to the position of the control button, 138 were on the steering column in the center, 48 on the side, 13 on the steering wheel, 10 on the instrument board, and 8 in other positions.

Cantilever Spring Discussed

J. G. Utz discussed "Cantilever Springs" at considerable length and stated that the Lanchester type of spring does not conform to the technical definition of a cantilever spring. The Lanchester spring is defined as including a combination of links like those of a pantograph intended to avoid "shuffling"

of the tires when the axle moves in relation to the frame and also to take torque and drive. The term "half-elliptic cantilever" is suggested as best describing the springs in question as now used. In recapitulation the points in favor of the cantilever suspension are listed as follows:

Advantages of Cantilever

1. Decreased weight over three-quarter-elliptic or platform types.
2. Increased pendulum length, producing slower vibration.
3. Increased physical comfort due to decreased inertia effect.
4. Increased damping ability.
5. Decreased fiber stress.
6. Increased dynamic life.

Discussion of Utz's paper was lengthy, much of it being contributed in the form of letters. Practically all of the contributed discussion denied nearly every premise taken by the author. The consensus of the written criticism was, that the flexure figures were inaccurate and not borne out in practice. The stiffness figures were also criticised.

Cantilever Versus Others

Another point that was the subject of criticism by the members that submitted written discussions was that the method used to find the velocity is faulty. In fact, it was stated by several that the entire procedure in making the calculations in the paper was based on false premises.

Henry Hess said, "What magic is there in the name Cantilever that makes one leave the safe ground of mathematical calculations to indulge in conjectures which are not borne out by facts?" He pointed out that there is no difference in the action of a cantilever as compared with a semi-elliptic, three-quarter, or any other type of spring so long as the deflection curves are similar.

Deflection Curve a Feature

He said that the deflection of the curve of the average spring is straight. This curve referred to is the curve of deflection per given load. Hess said that ever since springs had been designed men had been trying to secure a curve of deflection which would start with a gradual slope and then increase until a certain point, at which the curve would become vertical.

The vertical portion of the curve would mean the point at which no further deflection was given regardless of what load was applied.

Walter M. Newkirk suggested that probably the great increase in the use of cantilevers was due to the greater deflection allowed by this type of spring.

Advanced Maintenance

ALIGNING THE WHEELS

By George Fernwell

(Continued from last week.)

One of the difficulties of carrying out in an ordinary repair-shop the work of realigning the front wheels of the chassis, especially in the course of straightening a bad case of bent front axle, steering knuckles and steering knuckle arms, is the absence of a blueprint giving the normal dimensions, angles, etc., of inclination of the wheels, etc., such as a factory repair-shop would have available in repairing its own make of car. Such data not being available makes it necessary to find some other means of determining with practical exactness just what should be the normal position or angle of any one part or unit of the front wheel, steering knuckle, and front axle assemblies.

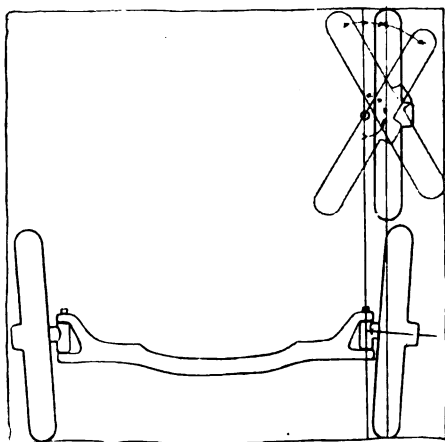


Fig. 1.—Front wheels usually are closer together at the bottom than at the top to make steering easier and reduce the strain on the steering gear

There are numerous directions in which the front wheels and the connecting mechanism may be "out of line" individually, and also relatively, to the adjacent members.

An example in which the judgment must usually be relied upon to determine what was the normal condition or relative position of two units in the chassis assembly may be found in the previously referred to "toeing in" of the front wheels at the forward part of the front tires level with the center of the hub. That is to determine if the front wheels were normally "toed in" forward, or if

they were parallel to each other regarded in a horizontal direction.

Another instance of necessary exercise of judgment may be found in determining whether the front wheels when in a "straight ahead" position were normally parallel perpendicularly or otherwise if they were inclined toward each other at the floor, and if inclined, to what degree.

This inclining or "toeing in" at the ground, although prevalent, is not necessarily common to all makes of cars, or necessarily common to all models of any one make. In those chassis in which the front wheels normally "toe in," there may be considerable variation in the degree of inclination or obliqueness of the front wheels of different make of chassis.

Why the Wheels Are Toed In

As briefly as it may be stated, the reason for inclining the wheels nearer towards each other at the ground is according to the degree of inclination to reduce the radius of or in extreme cases to eliminate the arc through which the wheels, if perpendicular, would swing backward or forward in steering.

To eliminate the traversing of the arc referred to the wheels would have to be inclined toward each other at the ground to such a degree that the precise central point of contact of the tire with the ground would be exactly perpendicular with the axis of the pin of the adjacent steering knuckle.

Doing One Thing at a Time

To return to the case of steering knuckles and axle roughly straightened, ready for careful alignment, but which were so deformed that there remained no apparent guide to determine their normal contour to which to straighten them: by giving undivided attention to each deformed unit in turn, so that each in turn is straightened to as close a degree of exact alignment as is found practical, the straightened units then may be reassembled with a reasonable assurance that the various parts will have been

restored to very nearly their normal position.

Obviously, the greater degree of exactness to which each individual deformed unit is straightened, the nearer their approach to normal positions when reassembled.

The above statements may apply to better advantage for the purposes of real work in the following summary of different tests for alignment of the units.

What Must Be Looked For

1. The extreme forward ends of the side members of the chassis should be tested for bends either laterally or perpendicularly or twists obliquely out of line with the part of the side member extending rearward of the front cross member.

2. The bent and twisted front axle should be straightened and untwisted and carefully made to conform with tests for front axle alignment so as to insure:

- The spring pads lying in the same horizontal plane when tested from the front of the axle and from one end of the axle.
- The normally perpendicular boring mechanism may be "out of line" in perpendicular with the horizontal plane of the spring pads viewed both from the front of the axle and from the end.

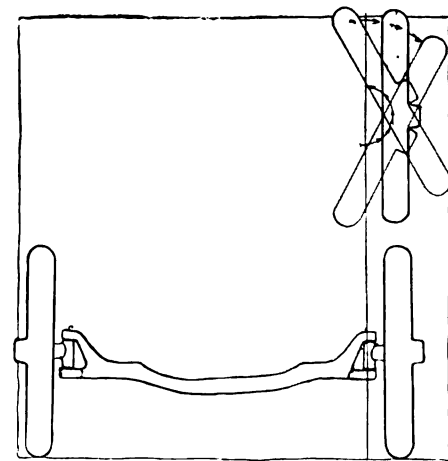


Fig. 2.—In some cars the wheels are not inclined but stand parallel and perpendicular under normal conditions. This is a point that must be considered by the repairman

c. As a check on the exactness of the degree of alignment in the last mentioned direction it should be insured that the perpendicular bores of the knuckle housings are parallel with each other viewed from the front of chassis, and that both are in exactly the same perpendicular plane viewed from the end of the axle. Practical methods and suggestions for testing axle alignment in the directions indicated by sub-tabulations a, b and c were given in Advanced Maintenance December 16 and 23.

3. The steering knuckle shaft or front axle end after roughly straightening should be tested between lathe centers, followed by a succession alternately of "close" straightening and retesting between centers until the machined front-wheel-bearing-seats machined on the knuckle shaft run as near to being absolutely "true" on centers as the skill of the workman can make them. Considerable attention has been given in recent issues to the work of straightening bent steering knuckle shafts, front axle ends or stub shafts, whichever may be the more generally understood name for the part of the steering knuckle which forms the bearing shaft of the front wheel.

Adjusting the Arms and Links

4. Any considerable deformation of the steering arm should be roughly straightened. Assuming that the corresponding steering arms on each knuckle were deformed, a closer degree of straightening must be deferred until the various units under discussion are reassembled. In roughly straightening the steering arm it should not be assumed without good reason that the normal direction of the steering arm should be at right angles with the axis of the knuckle shaft.

5. The drag link or transverse rod forming the connecting link between the

extremities of the steering arms may be straightened accurately. If the drag link has a means of adjustment so as to make it longer or shorter, the original adjustment and length of the rod should be noted before disturbing the adjustment if the latter should be necessary in order to make a more thorough job.

The above units or members of the front axle assembly assumed to have been aligned individually, as indicated, may then be reassembled together with the front wheels.

Determining Steering Arm Direction

According to the care with which each member has been aligned individually, the more or less closely should the front wheels at this stage approach their normal perpendicular or inclined position, as the case may be. A partial check on the results of the above aligning work would be that with the front wheels parallel to each other the distance be-

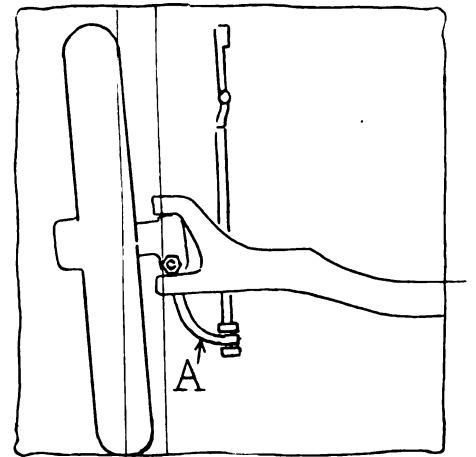


Fig. 5—The angle of the steering knuckle arm, A, vitally affects the steering of the car and it is essential that this should be correct

as to quickly bring the front wheels to a satisfactory state of relative horizontal alignment.

Before commencing, however, he would

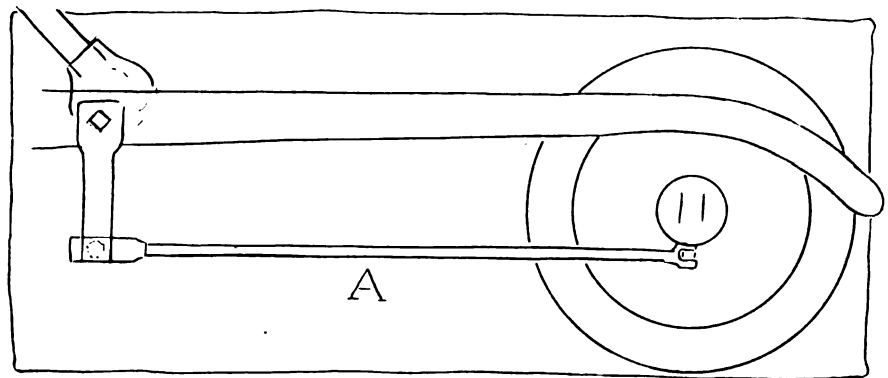


Fig. 4—All the connections in the steering gear must be carefully straightened and must be of the proper length if the results are to be satisfactory. If the rod A is not of the correct length the steering wheel will not be in the proper position when the road wheels are set for driving straight ahead

tween the two front wheels at the floor should correspond closely with the corresponding distance between the two rear wheels.

Assuming the latter check on their alignment to have been conformed with, the next step would be to determine the normal direction of the steering arms with relation to that of the front wheel bearing shaft.

As mentioned before, the steering arms of both steering knuckles are assumed to have been so deformed that neither could be used as a guide in straightening the other to the angle it should form normally with the knuckle shaft or front wheel bearing shaft.

At this stage a practical and fully experienced repair man would proceed with a minimum expenditure of time and labor to make a series of judicious settings or adjustments of the direction of the steering arms with the aid of a bending iron or a heavy monkey wrench, so

see that the steering wheel was in its proper rotative position for driving straight ahead with the ignition and carburettor control levers in their normal position for the make and model of car under repair. In other words, the front wheels, the steering wheel and control levers should each be in their correct position for driving straight ahead.

The workman lacking experience cannot expect to proceed by such direct methods to produce a practically accurate alignment without a little study of the theoretical reasons for the angular position of the steering arm relative to the knuckle shaft and method of determining what the angle should be. This will be taken up a little further on, meanwhile a summary may serve to make clearer the process just described of setting the deformed steering arms so that the steering wheel and the front wheels are given their proper relation for the straight ahead position.

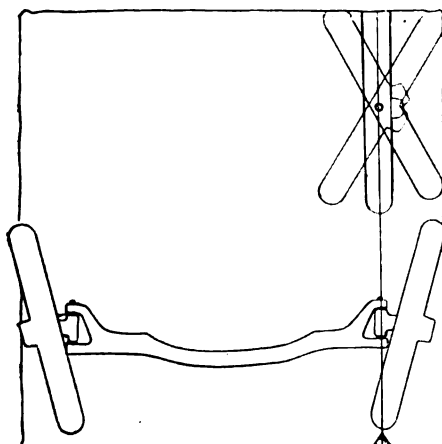


Fig. 3—Showing the wheels inclined until the point of contact with the ground at A coincides with the center of the steering pivot

Tradesmen Who Assume New Duties

Resignations and Promotions Place Many Workers In New Positions—Few Leave Industry

John T. Hart has been appointed general manager of the Auto Parts Co., Chicago. He has been identified with the accessory and parts trade in the Middle West for several years.

E. B. Finch, who has been connected with the Packard Motor Car Co. and the Chalmers Motor Co. in their executive departments, has been appointed general sales manager of the Standard Motor Truck Co. He will also be first assistant to President Albert Fisher.

Henry T. Myers, for some years manager of the wholesale branch of the Studebaker Corp. in Boston, Mass., has been promoted to have charge of the commercial car sales at the factory, and G. N. Jordan, traveling sales representative in New England, has been appointed New England branch manager.

Charles E. Van Horne has resigned as manager of the Commercial Car Department of the Studebaker Corp., Detroit, and has been succeeded by Henry Myers, manager of the Studebaker branch in Boston, Mass. Myers' successor in Boston is George N. Jordan, former Studebaker traveling sales representative in New England.

H. M. Wise, who began 15 years ago with the Decauville and who lately has been road man for the Studebaker in the Middle Atlantic states, has joined Harry Houpt's sales staff. Houpt handles the Mitchell in New York.

John Clark, formerly of Patridge, Clark & Kerrigan, appeared at the New York show as a member of the New York Chalmers sales staff.

Orlando Weber, formerly New York sales manager for the Palmer-Singer, has gone abroad. While the details of his mission are not entirely disclosed, he is said to plan to sell trucks to foreign governments.

D. C. Hathaway, until recently with the Cleveland branch of the Firestone Tire & Rubber Co., has been appointed manager of the solid tire department of the Kelly-Springfield Tire Co.'s Cleveland branch.

H. B. Young has been appointed manager of the Cleveland branch of the Chicago Pneumatic Tool Co. and will have charge of both the commercial car and tool departments. Young has recently

been identified with the Cleveland Velie dealer.

M. Howard Cox, formerly with the Rhineland Machine Works, New York city, has been appointed Ohio, Indiana and Michigan representative of the Fafnir Bearing Co., New Britain, Conn. His headquarters will be in Detroit.

Wallace M. Williams, formerly advertising manager of the Franklin Automobile Co., Syracuse, has joined the advertising department of Pierce's Farm Weeklies, Des Moines, Ia.

George H. Bryant has resigned as advertising manager for the Velie Motor Vehicle Co. to join the Williams & Cunningham advertising agency, Chicago. He attended the New York show in connection with the Thomas B. Jeffery exhibit, which account that agency handles.

Lester I. Ris, who for the past year has been a traveling sales representative for the Republic Rubber Co. in New York State and Connecticut, has been appointed manager of the New York branch of the Knight Tire & Rubber Co., Canton, O., which has just been opened at 215 West 51st street, New York city. Ris was formerly manager of the Century Tire Co.'s Buffalo branch under the direction of General Manager H. J. Woodard. Woodard is now eastern district manager of the Knight company and will direct the operation of the Knight branches in Boston, New York, Philadelphia and Baltimore.

Made in U. S. A. Exposition

A "Made in the U. S. A. Industrial Exposition" is to be held in Grand Central Palace, New York, March 6 to 13, as part of the nation-wide movement to popularize and permanently establish the "Made in the U. S. A." slogan and trademark. The exposition is designed to show American-made and American-grown products in practically all branches of business, and it is held at a time of the year when New York is the mecca of mercantile buyers from every section of the United States.

Mowe Assistant to Cook

Otis R. Cook, general sales manager of the Kelly-Springfield Tire Co., has announced the appointment of John V.

Mowe as assistant general sales manager. Mowe has been prominently identified with the tire trade during the past 10 years, the first 7 of which were in the capacity of Detroit manager for the Firestone company. During the past 3 years he has been a representative at large for the Goodyear tire interests. Cook's headquarters are at the Cleveland offices of the company and Mowe's are in Detroit.

Havers Equipment Sold

Bids for the real estate, building and power house of the bankrupt Havers Motor Car Co., Port Huron, Mich., have been so low that none was accepted; Trustee Frank A. Wilson, however, accepted the offer of \$7,500 made by the Harris Bros. Co., Detroit, for the equipment.

Taxi Companies Lose Rate Fight

The taxicab companies of New York city have lost their fight for a private taximeter rate as against the legal fare set by the aldermen. Mayor Mitchel has approved the amendment to the ordinance putting every vehicle operating with a meter under the public hack law.

Changes in Velie Organization

Several changes have been made in the organization of the Velie Motor Vehicle Co. R. R. Bush, formerly sales manager, has been made manager and will have full charge of the entire affairs of both the Velie Motor Vehicle Co. and the Velie Engineering Co. George H. Lloyd is to fill the office of sales manager made vacant by the advancement of Bush. W. H. Morgan continues in charge of sales in Illinois, Iowa and Wisconsin. H. T. Wheelock, of the truck sales department, assumes the duties of advertising manager.

Bloods Going to Allegan

Efforts on the part of citizens of Allegan, Mich., to have the Blood Bros. Machine Co. remove to that city from Kalamazoo have been successful; \$50,000 has been raised by Allegan for this purpose. The location for the factory has not been selected, but it is stated that arrangements will soon be completed and that the company will bring out a small four-cylinder roadster and touring car in June or July.

Walpole Tire Sale March 10

The Walpole Tire & Rubber Co. will be sold March 10 without restrictions, except that no bid will be received unless accompanied by a certified check for \$50,000. The sale will be held in Wal-

pole, Mass., at 11:30 A. M., and the property will be sold as a whole and as a going concern to the highest bidder. The court has issued an order setting aside \$37,500 of the money now in the hands of the receivers for the payment of a 3 per cent dividend to all creditors whose claims had been allowed up to January 4. This is the fifth dividend paid creditors since the receivers were appointed.

Hawkins Cyclecar to Dissolve

The Hawkins Cyclecar Co., Xenia, O., has instituted dissolution proceedings; it states that the purpose of the corporation failed in that it was unable to make and market the product contemplated.

Rutherford Opens Three Branches

The Rutherford Rubber Co., Rutherford, N. J., has opened new factory sales branches at 32 Shrewsbury street, Worcester, Mass., with Arthur G. Dodge, Worcester, as manager; at 336 Bridge street, Springfield, Mass., with D. C. Kibbe, Springfield, as manager, and at 584 Summit avenue, Jersey City, N. J.

Crescent Receiver Asks Court's Approval

Since his appointment as receiver of the Crescent Motor Co., Carthage, O., Louis J. Huwe has collected \$17,944.51 and expended \$8,650.56, according to his report to the court in Cincinnati. This leaves a balance of \$9,337.51; the other assets are appraised at \$101,171.55. He has asked for a confirmation of his report.

Six Cars Added at Importers' Salon

Six more foreign cars were added late last week to those on exhibition at the Importers' Salon in the Hotel Astor ballroom, New York city. One of these is the Peugeot, a three-passenger coupe with inside drive on a 14-32-horsepower chassis; a landaulet upholstered in fawn broadcloth with mahogany woodwork on the same chassis, and a new 40-92-horsepower stripped chassis. Both bodies are by Hayes & Miller. A Renault 18-horsepower limousine-brougham with a dark basket-work body by Kellner, of Paris, has the interior door panels with inlaid mahogany contrasting well with the drab broadcloth lining. A new Lancia, a four-passenger Berline on the standard 35-horsepower chassis; the body is by Holbrook and is light gray with darker trimming, the upholstery harmonizing with the general scheme. Another Lancia, a seven-passenger limousine, finished in green with black trimmings, was added to the Holbrook body exhibit. The upholstery is buff-colored.

REO PROFIT DURING YEAR TWO MILLION AND HALF

For Twelvemonth, More Than 13,500
Cars Were Shipped—Production

Facilities to be Further
Increased

During the fiscal year ending October 31, 1914, the Reo Motor Car Co., Lansing, Mich., made a net profit of \$2,539,187.34. As a result it is stated that some time in January the shareholders will be given a large extra dividend. During the ten years of its organization the Reo company has paid dividends totaling 1,527 4/10 per cent of its original capitalization, which was \$500,000.

During the present year there were built and shipped 13,516 passenger cars, having a total value of \$16,332,000, which brings the total number of cars made by the company since it started in business to a few less than 70,000, having a total value of \$75,000,000.

With the increase of its capital stock from \$2,000,000 to \$3,000,000, arrangements have been made to greatly increase the production facilities of the plant, and beginning February 1 a schedule of 100 cars a day will be maintained. More than 2,300 men are on the payroll and this force will probably be increased shortly. The balance sheet follows:

ASSETS	
Cash on hand and in banks.....	\$734,920.21
Accounts and bills receivable less reserves	656,785.83
Merchandise inventory at cost.....	1,923,212.10
Outside investments	3,000.00
Property account	1,765,989.47
Prepaid expenses	6,251.26
Total	\$5,090,158.87
LIABILITIES	
Accounts payable	\$337,578.35
Accrued pay rolls and salaries.....	45,293.45
Accrued taxes	15,205.00
Capital stock	3,000,000.00
Surplus	1,692,082.07
Total	\$5,090,158.87

Every one of the 2,420 men and women, from the office boy and the telephone girl to the heads of the various departments of the Reo Motor Car Co. and the Reo Motor Truck Co. were given a \$5 gold coin as a New Year's present.

Monthly Dinner To Service Men

A monthly dinner to the service department staff has been made a permanent feature by the Detroit branch of the Oakland Motor Car Co., 1237 Woodward avenue. The plan was worked out by Service Manager Allen H. Frost and grew out of a series of weekly service talks by him. The dinners are served in the basement of the branch's new

building and 24 service men with six from the sales and accounting departments attended the last one. At these dinners service problems are informally discussed by every one, and full dress is not required.

Racine Rubber Prospering

The Racine Rubber Co., Racine, Wis., January 2 paid its regularly quarterly dividend of 1 1/4 per cent on its preferred stock, which is 7 per cent cumulative. The company has just closed a prosperous year, having made net earnings sufficient to pay its preferred dividends 30 times over. A 50 per cent. stock dividend of 1 1/2 per cent cash was paid on the common stock in November.

To Stage Transcontinental Zig-Zag Tour

As a business-boosting venture, the Automobile Accessories Co., Buffalo, will early the coming season start a car on what it terms the Transcontinental Zig-Zag Tour of the United States. President Linford, inventor of the Klimax Signal, will drive the car, and Treasurer Floyd will lecture before clubs and other organizations, any proceeds realized being used to defray expenses. The car will be equipped with various safety devices.

Hood Common Increased \$1,000,000

The stockholders of the Hood Rubber Co. have voted to increase the common stock from \$1,000,000 to \$2,000,000 out of surplus. The directors later voted to issue \$150,000 additional preferred stock. This makes the total amount of preferred stock outstanding \$2,300,000.

Grand Rapids to Organize

The automobile and accessory dealers of Grand Rapids, Mich., will form an association to be known as the Grand Rapids Automobile and Accessory Dealers Association. A meeting for organization is to be held this month.

To Sell Deaco Assets

Referee in Bankruptcy Lee E. Joslyn, Detroit, has ordered that the property of the bankrupt Detroit Electric Appliance Co., Fort and 4th streets, be sold at public auction by the Detroit Trust Co., trustee. The bankrupt concern made the Deaco starter.

Dodge Representation in Hartford

The Hartford Motor Car Co. has appointed Dodge Bros. dealer in Hartford, Conn. A new three-story brick building is being erected at 406 Main street. The first floor to be used as the salesroom, the second floor for the offices and the

third for a stock of parts for Dodge Bros. cars and all models of Pope-Hartford pleasure cars, trucks and fire apparatus.

Extends Fire Alarm System to Garages

In San Jose, Cal., which has a population of 30,000 and a dozen garages, the Fire Commissioner has arranged with the garages on the east side of North 1st street, the motor row, to install fire alarm boxes which are connected with the city fire alarm system.

Plan Cooperative Garage

A company has been formed by I. S. Myers and others in Akron, O., to build a community garage on Forest street, near the center of the business district. It is planned to erect a building that will cost \$100,000.

Portland Branch for Studebaker

The Studebaker Corp. has opened a branch in Portland, Me., at the Central Garage on Oak street. C. A. Laidlaw has been appointed manager, with O. B. Buker in charge of the sales department.

New York Buys 20 Macks

The International Motor Co., New York City, has received an order from the New York Fire Department for 20 Mack high-pressure hose wagons, making a total of 73 pieces of Mack fire apparatus of various types supplied to the city by that company within the past 2½ years.

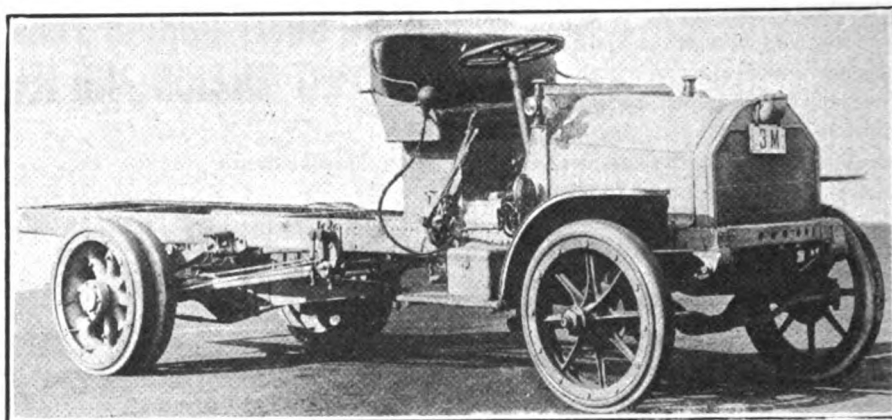
The Bureau of Highways, Department of Public Works, has purchased six 5-ton Saurer tractors, to be used in the repair of asphalt streets when the contractor's guarantee of maintenance of his work has expired.

Lansdale Krit's Custodian

Henry Lansdale, general manager of the Krit Motor Car Co., which, with the Krit Sales Co., filed a petition in bankruptcy last week, has been appointed custodian of both concerns. The trustee will be appointed January 18 at a meeting of the creditors.

Maxwell Branch in New York

The Holt-Chandler Co., which formerly handled the Maxwell in New York, has not been in business since August; the business is handled as a factory branch of the Maxwell Motor Co. The Holt-Chandler name was incorrectly used in a story in Motor World December 3 regarding the Maxwell's saleswomen's work. This sales work is being made national.



In the new model Locomobile trucks the motor is mounted forward and chain drive has given way to worm drive; 3- and 4-ton capacities are made

LOCOMOBILE ADDS WORM-DRIVE TRUCK

Motor Mounted Forward in Two Models,
3- and 4-Ton Capacity

The Locomobile Co. of America, which long has built trucks with the motor under the floor and with chain drive, has brought out a type with the motor forward-mounted and with worm drive. The new vehicles are of practically the same design as the older types and are of 3 and 4 tons capacity. They continue the use of right steer and lever location and of steel wheels. A notable feature in connection with the latter is that the rear wheels of the new models are of the hollow cast pattern. Prices, 3-ton, \$3,500; 4-ton, \$3,600. The annual production will be from 1,200 to 1,500 trucks, though as many as 1,800 may be turned out.

Monihan Marion General Manager

John Guy Monihan, for many years identified with the advertising and sales management of the Premier Motor Car Co., Indianapolis, and later general sales manager of the Cole Motor Car Co., of the same city, has been made vice-president and general manager of the Marion Motor Co., Indianapolis.

J. I. Handley, president of the Marion Motor Car Co., and who has just become president and active head of the Mutual Motors Co., retains the presidency of the Marion company, but relinquishes the management to Mr. Monihan.

Toledo Names Show Date

The Toledo Auto Shows Co., at its annual meeting decided to hold its show in the Terminal building, February 8 to 13, under the management of Hugo V. Buelow. The following officers and directors were elected: President, J. G.

Swindemar; vice-president, Guy R. Ford; secretary, H. W. Blevins; treasurer, J. W. Banting. A. A. Atwood, B. O. Gamble, T. H. Deardorf and the officers constitute the board of directors

Bright Days Ahead, Says Daly

Walter L. Daly, sales manager of the King Motor Car Co., after an absence of five weeks, during which he visited King dealers and representatives in St. Louis, Mo., Kansas City, Mo., Minneapolis, Minn., San Francisco, Cal., Los Angeles, Cal., Spokane, Wash., Portland, Ore., and other cities in the West and on the Pacific Coast, states that prospects for business during the spring and summer months are bright. The King company will operate its plant 24 hours daily beginning February 1. Deliveries will begin on the new eight-cylinder King this month.

Rowland Meets Trouble

The Rowland Gas-Electric Vehicle Corp., which was formed in New York city in November to manufacture a gasoline electric truck designed by P. K. Hexter, has assigned for the benefit of its creditors. It has a capitalization of \$200,000. War conditions are given as the cause. Following the assignment a petition in bankruptcy was filed against this company by the St. Louis Car Co. Liabilities are said to be about \$55,000 and the nominal assets are placed at about \$25,000.

Federal Rubber Enlarging

The Federal Rubber Mfg. Co., Cudahy, Wis., is having plans prepared for a factory addition, 44 x 124 feet, two stories high, of fireproof construction. The addition is part of the \$500,000 improvement scheme instituted about July 1 of this year. The capacity of the tire works is to be more than doubled within a year.

Dealer's Legal Status

The Man Who Makes a Deposit and Then Decides Not to Take the Car Forfeits His Right to the Deposit—It is But One of Many Cases of Breach of Contract

By George F. Kaiser

Q. A man came to me at a show and agreed to buy a car for \$900. He agreed to pay \$200 deposit; he gave me \$20 of this and said he would mail a check for \$180 the following day as balance of the deposit, which he did. He came in a few days later and said he wished certain instructions about the car, which I gave him. He asked permission to leave the car with me for a few days until he could look up a suitable garage. He then sent me a check for the \$700 balance.

The same day I received this check he telephoned me saying that he was unable to find a garage and that he had changed his mind and did not want the car. The \$700 check was returned to me marked "Payment Stopped." I held the car for a month for him and then sold it. After I had sold it he demanded the return of his original \$200 and when I refused threatened to sue me. Have I or have I not the right to retain this \$200?

C. L. M.

Delivery of Car Never Made

A. Your case is an ordinary case of breach of contract.

As delivery of the car was never made, there being only a promise to accept the car and pay for it on the part of the person with whom you dealt, the car was yours and you had a right to resell it at your pleasure. If you had been unable to resell the car for as much as this man had agreed to pay for it, you would have been able to sue him for damages for non-acceptance. That would be the difference between what you were able to get for it and what he had promised to pay.

A case similar to yours was the case of Cedar Rapids Auto Co. vs. Jeffery, 116 N. W. Rep. (Iowa) 1054, decided in 1908. In that case a motor car selling agency had been established. The contract provided that an advance payment or deposit of \$25 was to be made on each car shipped; 25 cars were ordered and the \$25 was advanced on each car.

Thereafter the party putting up the deposit sued for the return of this money, claiming that the contract had been rescinded by the company's misrepresentation. The court held that, as the party putting up the deposit had failed to live up to the terms of his contract, he could not recover back the deposits he had made on the cars, saying, "As to these cars, plaintiff stands in the relation of a buyer who has paid a part of the purchase price in advance of delivery, and it is an elementary proposition of law that it cannot, without good cause, refuse to consummate the deal and demand a return of the payment."

Justified in Selling Car

This case is quite similar to your own, and the law in it is well established. You were justified then in selling the car and applying the amount you received for it on the unpaid balance which your customer was to pay, and no reason appears in your inquiry why you should not retain the \$200 you received as a deposit.

When a person who has agreed to sell personal property finds out that his customer has broken the contract, he may decide whether he will store the property on account of the customer and sue him for the entire agreed purchase price; whether he will sell the property, acting as the customer's agent for that purpose, and sue to get back the difference between the contract price and the resale price, or he may keep the property, considering it to be his own, and sue the customer for the difference between the market price at the time and place where delivery was to be made and the contract price.

Of course, if the motor car, or whatever personal property has been contracted to be sold has passed from the possession of the seller to the possession of the buyer, the case is different, and the only thing that the seller can do is to sue on the contract.

It is important to take note in cases of breach of contract that a contract is broken only at the date when certain

goods were to have been delivered and not the date when a buyer may give notice that he intends to break his contract and refuse to accept the goods. In other words, the time of breach of contract may be a date 6 months from today, although the buyer may give notice today that he does not intend to receive the goods in 6 months.

Vagueness Tends to Invalidate

An interesting Georgia case was recently decided. A motor car manufacturer sued a man with whom he had a contract for an accounting and recovered judgment against him, which judgment was also affirmed on appeal. The person sued sought to set up his contract with the manufacturer as a defense to the action.

The court refused to consider the contract on the ground that, when a contract is too vague and indefinite as to the relation thereto between the parties and it is impossible to determine whether the contract is one of agency or purchase, it is invalid.

The court further said that a provision for a discount on the purchase price of cars and a commission on their selling price in the same contract are so inconsistent that they are incapable of enforcement at the same time, unless it is shown that there was to be a discount and a commission in addition thereto.

It was further decided that when no time is fixed wherein a contract is to be terminated, the law will allow a reasonable time for its determination, which, of course, would have to be fixed by a jury. (*Jones vs. Americus Automobile Co.*, 83 S. E. (Georgia) 642.)

Woods Sales Office Moved

The sales manager's office of the International Cycle-Car & Accessories Co., has been removed from Chicago to the Woods Mobilette factory, Harvey, Ill. The object in making this change is that the company may keep more directly in touch with car shipments and future deliveries of Woods Mobilettes, for which it has the exclusive distributing contract for the United States and all foreign countries. All matters pertaining to dealers' contracts, car shipments and orders for Woods Mobilette parts and equipment will be cared for at the office in Harvey, Ill., which is in charge of O. Richard Wolfe, sales manager, and J. C. Long, secretary and treasurer. The executive offices will be retained as formerly at 1109 Security building, Chicago, and the showroom and local salesroom at 1509 Michigan boulevard.

The Week's INCORPORATIONS

Tulsa, Okla.—Auto Repair & Mfg. Co.; \$10,000. L. F. Barnes, M. O. Randall, M. A. Campbell.

Trenton, N. J.—Three Star Tire Co.; \$50,000. E. H. Steel, A. F. Updike, R. G. Whitehead.

Mayville, N. Y.—Mayville Hardware & Garage Co.; \$25,000. A. H. Brace, Harry Arnold, S. E. Swetland.

Brooklyn, N. Y.—Uno Garage Co.; \$1,000. H. D. Bristol, F. W. Shaw, both of Oceanside, N. Y.; Carlo Rossa.

New York City—West 67th Street Garage; \$5,000. Lillian Carlin, S. L. Cohen, Rose O'Rourke, all of 31 Nassau street.

Milwaukee, Wis.—Pirate Motor Mfg. Co.; \$50,000; manufacturer gasoline engines. Herman Roth, Julius Tanck, John Krohn.

Antigo, Wis.—Utility Steel Tractor Co.; \$24,000; manufacturer tractors and trucks. S. D. Stewart, N. C. Nordin, F. A. Hecker.

Indianapolis, Ind.—Adjustable Auto-Show Co.; \$10,000; manufacturer. W. A. Parr, L. O. Gil-laspy, G. E. Parr.

Connersville, Ind.—Connersville Taxi Co.; taxi-cab business. F. B. Ansted, Grant George, H. M. Williams.

Chicago, Ill.—Federal Motor Truck Co.; \$10,000; manufacturer and servicing of motor trucks. M. L. Puhlner, E. R. Lightcap, J. F. Brown.

Lansing, Mich.—American Double Service Tire Co.; \$3,000; dealer. Hanley Dawson, J. G. Pennell, B. C. Pennell.

Logan, O.—Main Motor Car Co.; \$25,000; dealer. T. C. Johnson, A. H. Johnson, Flora Spohn, F. A. Koppe, L. K. Kienle.

Detroit, Mich.—Magee Sheet Metal Machinery; \$20,000. W. R. and D. R. Magee, F. W. Atkinson.

Philadelphia, Pa.—Olewine's Garage; \$50,000; to maintain storage houses and garages. F. R. Hanshell, G. Purnell, S. C. Seymour.

Trenton, N. J.—West End Garage & Machine Co.; \$25,000. E. G. Hancock, C. E. Hancock, W. T. Johnston.

Wakita, Okla.—Clinesmith Motor Co.; \$5,000. F. L. Clinesmith, John Clinesmith, William Clinesmith.

Newark, N. J.—Gibraltar Tire & Tube Co.; \$100,000; manufacturer. H. L. Brown, R. Bradshaw, R. Brown.

Bucyrus, O.—Bucyrus Rubber Co.; \$150,000; manufacturer. G. M. Smith, J. Taylor, H. B. Stewart, E. L. Smith, I. H. Taylor.

Kansas City, Mo.—Summers Motor Devices Co.; \$5,000. W. E. Robbins, C. E. Summers, C. E. Adams.

Dayton, O.—Bates Motor Car Co.; \$10,000; dealer. O. E. Bates, E. G. Bates, C. E. Bates, A. M. Bebhart, J. C. Schneffer.

Bronx, N. Y.—Champion Electric Mfg. Co.; \$50,000; electrical devices for motor cars. Mauro Lamparelli, 2312 Hughes avenue, Bronx; Salvatore Scognamiglio and Frank Scognamiglio.

Oshkosh, Wis.—Universal Motor Co.; \$25,000; to take over the business of Termaat & Monahan Co., gasoline engines and motors. J. D. Termaat, L. J. Monahan, A. B. Dye.

Chicago, Ill.—Berlin Motor Co.; \$2,500; manufacturer and dealer in machinery, tools and motor car parts. T. W. Prindle, A. J. Schmidt, J. D. Daly, 30 North La Salle street.

Chattanooga, Tenn.—Spring City Auto Co.; \$1,000; dealer. J. D. Carlin, G. W. Stephenson, J. M. Adams, O. P. Darwin, C. C. Moore.

San Francisco, Cal.—Spring Hub Automobile Wheel Co.; \$200,000; manufacturer. W. T. Kearney, 621 Market street, San Francisco; E. Kreh, C. Westerman.

Newark, N. J.—Self-Raising Seat Appliance Co.; \$100,000; manufacturer automobile, mechanical, electrical, etc., stools, devices and appliances. S. M. Eisner, L. Lasser, O. W. Jackson.

Chicago, Ill.—Davis Electric Equipment Co.; \$2,500. E. S. Davis, J. E. Waters, I. G. Wooden.

Flint, Mich.—Dort Motor Car Co.; \$500,000; manufacturer. F. A. Aldrich and others.

Detroit, Mich.—Wolverine Winter Top Co.; \$2,000; manufacturer. J. E. Murphy, H. H. Creamer, G. F. Monahan.

East Orange, N. J.—Motor Sales Agency of the Oranges; \$25,000; dealer. H. F. Herdman, A. F. Herdman, A. T. Muir.

Middletown, N. Y.—Lion Sales Co.; \$5,000; dealer. R. F. Finch, C. M. Breiner, E. A. Hefernan.

New York City—Shaw Pearson Motor Corp.; \$2,000; dealer. O. F. Shaw, Jr., H. E. Meyn, 363 Lenox Road, Brooklyn; F. A. Hallock.

Brooklyn, N. Y.—Nonpareil Garage, Inc.; \$5,000. J. E. Kerr, Henry Redelsheimer, Samuel Goldberg.

Pulaski, Va.—Pulaski Motor Car Co., Inc.; \$25,000; dealer. J. W. Eckman, H. L. Trolinger, R. R. Moore, W. H. Trolinger, F. J. Laughon, H. W. Steger.

Increases in Capitalization

Cleveland, O.—Auto Repair Storage & Supply Co.; \$5,000 to \$10,000.

Toronto, Ont.—Canadian National Carbon Co., Ltd.; \$70,000 to \$500,000.

Motor Car Securities Quotations

	Jan. 9, 1914	Jan. 9, 1915
	Bid Asked	Bid Asked
Ajax-Grieb Rubber Co., com.	185 215	250
Ajax-Grieb Rubber Co., pfd.	98 101	100
Aluminum Castings, pfd.	.. 95	100
Chalmers Motor Co., com.	90 92	91
Chalmers Motor Co., pfd.	92 94	90 93 1/2
Firestone Tire & Rubber Co., com.	244 248	350 355
Firestone Tire & Rubber Co., pfd.	102 108	100 111
Garford Co., pfd.	80 90	..
General Motors Co., com.	43 1/2 44 1/2	84 1/2 85 1/2
General Motors Co., pfd.	82 83 1/2	82
H. F. Goodrich Co., com.	21 1/2 22 1/2	20 1/2 21
H. F. Goodrich Co., pfd.	81 1/2 82 1/2	81 95 1/2
Goodyear Tire & Rubber Co., com.	240 ..	185 188
Goodyear Tire & Rubber Co., pfd.	92 94	100 100
Gray & Davis, Inc., pfd.	92 100	..
International Motor Co., com.	..	..
International Motor Co., pfd.	.. 15	..
Kelly-Springfield Tire Co., com.	38 41	79 78
Kelly-Springfield Tire Co., 1st pfd.	106 106	79 80
Kelly-Springfield Tire Co., 2nd pfd.	..	100 101
Lozier Motor Co., com.	.. 15 1/2	..
Lozier Motor Co., pfd.	.. 90 1/2	..
Maxwell Motor Co., com.	3 1/2 4 1/2	17 1/2 18
Maxwell Motor Co., 1st pfd.	28 28 1/2	49 49 1/2
Maxwell Motor Co., 2nd pfd.	9 1/2 10	20 20
Miller Rubber Co., com.	110 125	150 158
Packard Motor Car Co., com.	..	100
Packard Motor Car Co., pfd.	92 95	92 1/2 95
Peerless Motor Car Co., com.	15 25	15 20
Peerless Motor Car Co., pfd.	75 80	.. 55
Pope Mfg. Co., com.	.. 3 1/2	..
Pope Mfg. Co., pfd.	.. 12	..
Portage Rubber Co., com.	.. 40	30 38
Portage Rubber Co., pfd.	.. 90	80 85
Reo Motor Truck Co., com.	6 1/2 7 1/2	10 1/2 11 1/2
Reo Motor Car Co., com.	14 1/2 15 1/2	22 1/2 24
Stewart-Warner Spdr. Corp., com.	50 52	53 1/2 57 1/2
Stewart-Warner Spdr. Corp., pfd.	94 96	100 102
Studebaker Corp., com.	19 1/2 20 1/2	35 1/2 36 1/2
Studebaker Corp., pfd.	71 73	92 93 1/2
Swinehart Tire & Rubber Co., com.	69 71	69 71
U. S. Rubber Co., com.	58 1/2 58 1/2	56 57
U. S. Rubber Co., pfd.	103 103 1/2	102 103 1/2
White Co., pfd.	105 110	108
Willis-Overland Co., com.	59 62	82 86
Willis-Overland Co., pfd.	84 86	92 94

Coming Events

Feb. 22, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Feb. 27, San Francisco, Cal.—Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

May 29, Indianapolis, Ind.—500-Mile Race, Indianapolis Motor Speedway.

THE SHOW CIRCUIT

Jan. 9-16, Philadelphia, Pa.—Automobile show, Metropolitan Building. Philadelphia Automobile Trade Association.

Jan. 16-23, Cleveland, O.—Automobile show, Wignmore Coliseum, Cleveland Automobile Show Co.

Jan. 16-23, Detroit, Mich.—Automobile show, Detroit Automobile Dealers' Association.

Jan. 19-23, Baltimore, Md.—Automobile show, Fifth Regiment Armory. Baltimore Automobile Dealers' Association and Automobile Club of Maryland.

Jan. 23-30, Chicago, Ill.—Automobile Show, First Regiment Armory and Coliseum.

Jan. 23-30, Montreal, Can.—Automobile show, Allen Line Liverpool Buildings. Montreal Automobile Trade Association.

Jan. 25-30, Buffalo, N. Y.—Buffalo Automobile Dealers Association's annual show.

Jan. 30 to Feb. 6, Minneapolis, Minn.—Automobile show, National Guard Armory.

Feb. 2-6, Kalamazoo, Mich.—Show; Armory, Harry B. Parker and John Van Loon, managers.

Feb. 8-14, Kansas City, Mo.—Automobile show, Convention Hall.

Feb. 15-20, Tacoma, Wash.—Show; A. L. Sommers, manager.

Feb. 15-20, Grand Rapids, Mich.—Automobile show, Klingman Furniture Exposition Building.

Feb. 15-20, Bridgeport, Conn.—Show; Armory.

Feb. 15-20, Omaha, Neb.—Show, Auditorium, C. G. Powell.

Feb. 23-27, Ft. Dodge, Ia.—Automobile show, Armory.

Feb. 23-27, Syracuse, N. Y.—Automobile show, State Armory, Syracuse Automobile Dealers' Association.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

March 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

MOTOR WORLD

The Dealers National Weekly

Volume XLII
No. 3

New York, January 20, 1915

Ten cents a copy
Two dollars a year

Electric Starting-Lighting for Ford Cars

REMEMBER these points, Mr. Dealer, when considering equipment for the FORD.

- That Gray & Davis build **nothing** but automobile electric equipment.
- that we are **specialists** in this field.
- that **all** our time and **all** our facilities are devoted to electric starting-lighting.
- that we produce instruments of highest quality.
- that our systems are developed by America's **foremost** designer of automobile dynamos and motors.
- that we have 80 Service Stations and 32 National Distributers.
- that our equipment is found on highest-priced cars.
- that Gray & Davis reputation is recognized wherever motor cars are driven.
- that we have spent and are spending, not thousands, but tens of thousands of dollars advertising our products.

Which do you prefer? Specialization, aggressive advertising, reputation and quality, or "any-old-kind" of system? Which will make the most money for you; which will give your customers satisfactory service?

GRAY & DAVIS, Inc.

Boston, Mass.

Old Man Mileage

says :

“First sales may mean cash in the pocket, but steady customers mean assets in the business.”

—“And the way to get the steady tire customers is to sell them nothing but quality tires, built to give real road service, honest, uninterrupted mileage.”

Republic Tires are quality tires, for quality dealers to sell to quality owners. They are the finest made tires in the world, and have an enviable reputation for giving the highest grade of service under all conditions.

Republics cost more to buy, but less to use. They are the tires that keep down the upkeep. Made in Plain and Staggard Tread, the latter being the original effective non-skid tire bearing patent dates.

We have an interesting proposition to the right kind of dealers. Write us.

THE REPUBLIC RUBBER CO.

Youngstown, Ohio

*Branches and Agencies in
the Principal Cities*



Republic *S T G A D* Tread
Pat. Sept. 15-22, 1908.



The Republic “W M” Tread Tire is the long mileage tire for light cars. It, too, has quality through and through.

30x3	.....	\$14.15
30x3½	.....	18.90
32x3½	.....	20.45

Also made in a few special sizes.



Republic Black-Line Red Inner Tube, the highest quality tube on the market. Outlasts two ordinary tubes. Packed in special weather-proof bags.



Copyrighted 1914, by The Republic Rubber Co., Youngstown, O.

How to Get the Bulk of the Brake Lining Business



Trade Advice:

Sell the brake lining you would buy yourself.

If you follow this plan you will build up a better business and make more money in the end.

Look at it from your customers' standpoint. They know that the quality of RAYBESTOS is supreme. They know that its service is superior to that of any other brake lining. They know that it is backed by the most comprehensive guarantee ever given any brake lining.

These factors are more potent in swinging the bulk of the brake lining business to you than any other consideration.

Getting the benefit of the prestige, quality and service of RAYBESTOS to help build up your business is worth far more to you than a little longer discount on some other brand of brake lining. Longer discounts are aimed to attract you.

Your customers do not benefit.

You cannot give them any better quality—nor more attractive prices. Service in a brake lining is what they want. Service and a cut price never yet went hand in hand. The quality—the prestige—and our business-like methods of distributing RAYBESTOS constitute too much of an asset to you for you to be tempted by smart selling methods.

RAYBESTOS discounts are fixed—the same to each

and every dealer. We believe in a square deal for everybody and we treat everybody exactly alike.

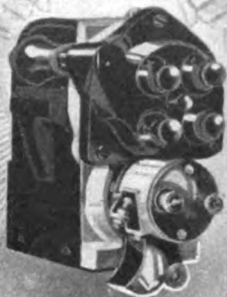
Quality is put into RAYBESTOS to insure service. The service of RAYBESTOS is definitely guaranteed. In every big city in this country there is a good, reliable concern which carries a complete stock of RAYBESTOS, ready to supply your needs on telephones, telegraphed or written order. Any one of these concerns will quote our standard discounts to the trade—their discounts are the same as we would quote you direct. Their nearness to you and their ability to make immediate deliveries of either large or small quantities make it unnecessary for you to carry more than an easily handled stock for your immediate requirements.

THE ROYAL EQUIPMENT COMPANY

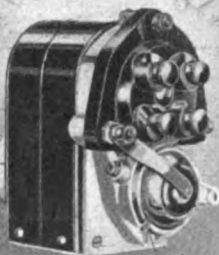
1379 BOSTWICK AVENUE :: BRIDGEPORT, CONNECTICUT

SPLITDORF

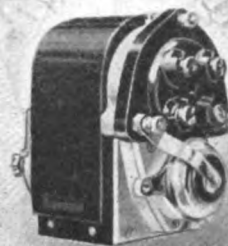
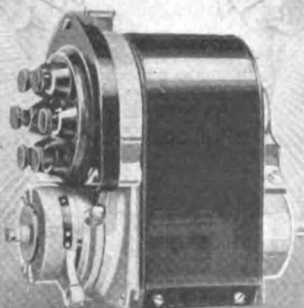
DIXIE
TYPE



MODEL EU4
HIGH TENSION
MAGNETO



CUNNINGHAM
HIGH TENSION
MAGNETO



MODEL EU4-2
HIGH TENSION
MAGNETO

Largest MAGNETO Contract Ever Placed

OVERLAND

ignition for 1916 will
be exclusively

DIXIE

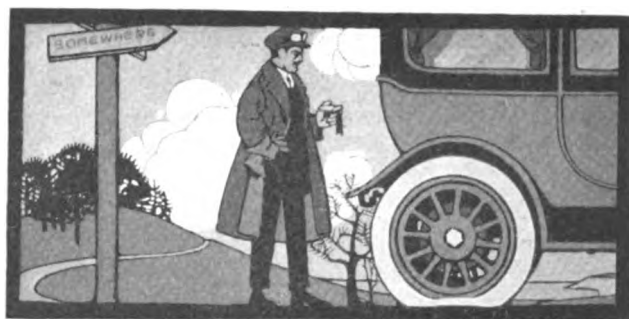
*The Willys-Overland Co. has placed
the largest magneto order ever given
for their entire 1916 output*

Not battery ignition—not the
19th century magneto, but
the 20th century DIXIE

SPLITDORF ELECTRICAL COMPANY
NEWARK, NEW JERSEY

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Another Puncture!

It always happens at the most maddening time—just when you want to catch a train or keep some important engagement. And usually it isn't really a puncture at all, but a leaky tube.

Now porous rubber (so-called) and leakage around the valves are among the commonest failings of cheap, machine-made tubes. If you are tired of these needless "punctures" equip your car with Kelly-Springfield Tubes. They are made slowly and painstakingly by hand out of real rubber. They can be punctured, of course, but *they won't leak*.

If you use Kelly-Springfield Tubes in Kelly-Springfield hand-made, real rubber tires you will add increased mileage to freedom from needless tube trouble.

Send for "Documents in Evidence" which tells the experience of others

Kelly-Springfield Tire Company

Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.

The Southern Tire & Repair Co., Houston and Beaumont, Texas

The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.

The Olmsted Co., Inc., Syracuse, N. Y.

Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.

L. J. Barth, Rochester, N. Y. Seifert & Baine, Newark, N. J.

Atkinson Tire & Supply Co., Jacksonville, Fla.

Central Rubber & Supply Co., Indianapolis, Ind.

C. D. Franke & Co., Charleston, S. C.

K. & S. Auto Tire Co., Limited, Toronto, Ont.

Todd Rubber Co., New Haven, Conn.

Barnard-Michael Tire Co., Buffalo, N. Y.





For Overland Dealers Only

In February we start an entirely new advertising campaign.

Every month we shall use a two-page double spread in four colors in

The Ladies' Home Journal

This paper is one of the most influential publications in the world.

It reaches 1,750,000 substantial homes every month.

No other automobile manufacturer gives its dealers such liberal and such beneficial cooperation.



Watch this space for other important announcements.

Handsome catalogue on request. Please address Dept. 50.

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, January 20, 1915

No. 3

Eight-Cylinder Ranks Swelled

Cole, Buda, Abbott-Detroit and Regal Add Eight Models—

Cole at \$1,785; Abbott-Detroit at \$1,685; and Regal at \$1,250

THE Cole Motor Car Co., Indianapolis, Ind., will exhibit at the Chicago show the first of its 8-cylinder models—a seven-passenger touring car with disappearing auxiliary seats, and a three-passenger roadster with the seats abreast, both selling for \$1,785. The car is electrically lighted and started by the latest Delco apparatus, the remainder of the equipment list including one-man top with cover and curtains, Stewart speedometer, power tire pump, inspection lamp, demountable rims with one extra, windshield, jack, and the usual assortment of tools.

Other specifications of the new Cole include cone clutch, left drive, center control, three-speed gearset, shaft drive to a floating rear axle with drive through the springs, three-quarter elliptic rear springs, 126-inch wheelbase and 35 x 4½ tires all around.

Detachable Cylinder Heads

The motor, which has 3½ x 4½ cylinders set in the approved V fashion, differs from most other eights in that the cylinder heads are detachable and the cylinders, though arranged in two blocks of four cylinders at 90 degrees to each other, are in unit with the crankcase. Each block has integral with it a longitudinally-split half of the crankcase. The division is made at the crankshaft center and the bearings are carried in one of the halves.

Another difference from the construction now employed by the majority of the eights is that the valves are operated direct from the camshaft with no intervening rockers or shafts. The hardened

THIS WEEK

THESE are epochal days for the motor car dealer. The industrial current is moving faster than for years. Each week brings out a new eight-cylinder motor and the air is filled with rumors of twelves. This week Cole and Buda are announced. Last week it was Herschell - Spillman and the week previous others were in the limelight.

These are busy days when the dealer must know his business, must know the cars he sells, must know the cars the other dealer sells, and must know all about accessories; in a word, you cannot make a success of a business unless you understand that business. With the object of assisting the dealer in this work, Motor World publishes for the first time this week its "Motor World Guide," two pages of the major specifications of the leading American cars. These two pages will appear each week, being revised and brought up-to-date. This "Motor World Guide" is the great ready reference guide for the dealer and his salesmen; it is part of the knowledge they need in a convenient form.

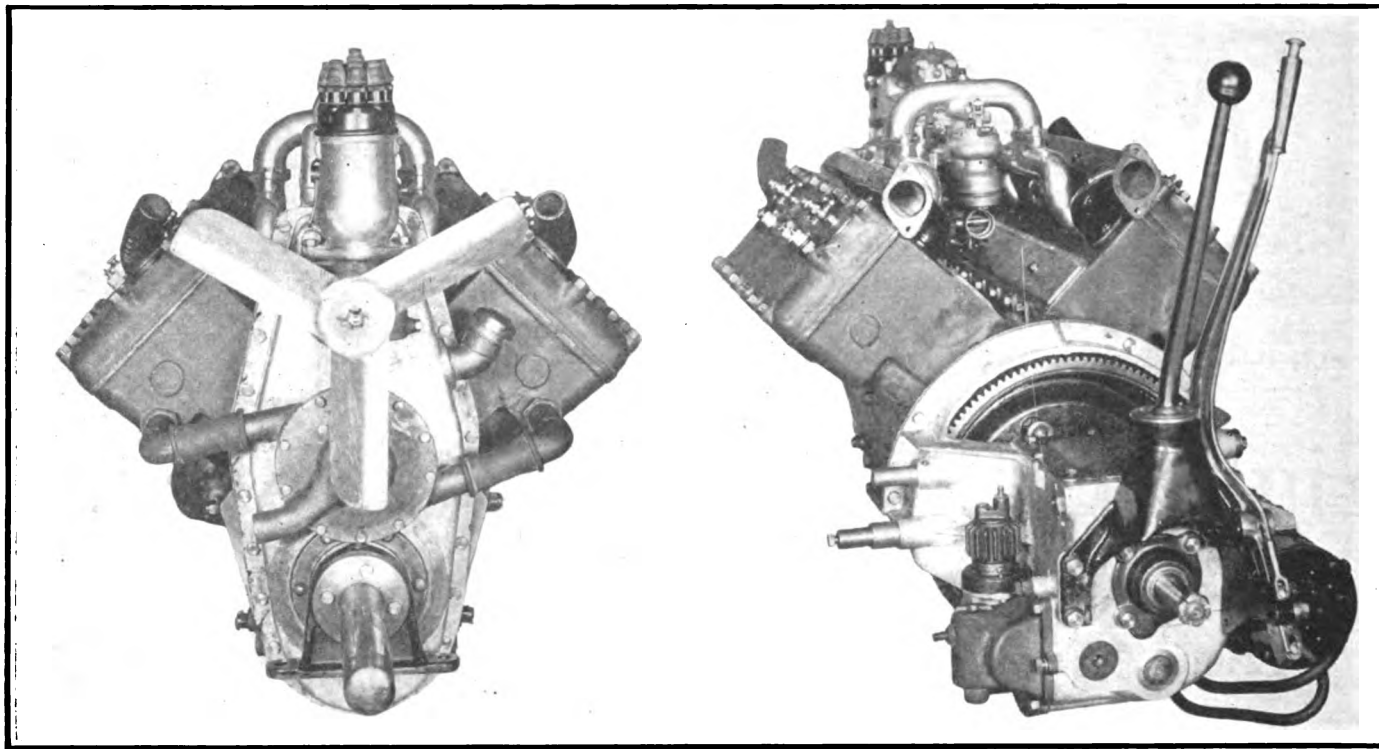
and ground tappets are fitted with steel contact rollers, also hardened and ground. These bear directly against the cams.

The camshaft and crankshaft and the method of connecting the rods to the latter through yoke ends and smaller ends fitted within the yoke arms, are features of the design which do not differ from general practice. The camshaft is the same in form as that used in a four-cylinder engine and so is the crankshaft, only each bearing or each cam, as the case may be, takes care of its regular function for two opposite cylinders instead of one directly overhead.

Unit Power Plant

Getting deeper into the design of the engine, which was constructed at the Northway factory, Detroit, for the Cole company, the power plant is of the three-point suspended unit type. That is, the clutch and gearset are enclosed within housings bolting to the crankcase. The cylinders have L-heads, so that the full set of valves is in the V between the two blocks in the usual way. They are completely enclosed. The carbureter and generator are placed in this V also, but they are placed as to cause little interference in making adjustments.

The crankshaft is carried on three main bearings, which are babbitt-lined bronze, and which have diameters of 2 inches front, 2 1/16 inches center and 2½ inches rear. The connecting rods are drop-forged in I-beam form with the shaft bearings 2½ inches in diameter. One rod has a yoke end, and to it the babbitt bearing is pinned, causing this



Opposite end views of the eight-cylinder Cole motor indicate the accessibility of its design. The cylinder heads are detachable, giving easy access to combustion chambers and valves for cleaning; the carburetor is in the V between the cylinder blocks; and the manifold connections are on top. The power-driven tire pump is conveniently mounted on the side of the gearbox.

bearing to oscillate with it on the rod as a bearing. The small-end rod which fits within the ends of the yoke is free to move on the outer surface of the babbitt bearing, and thus its bearing is on this latter.

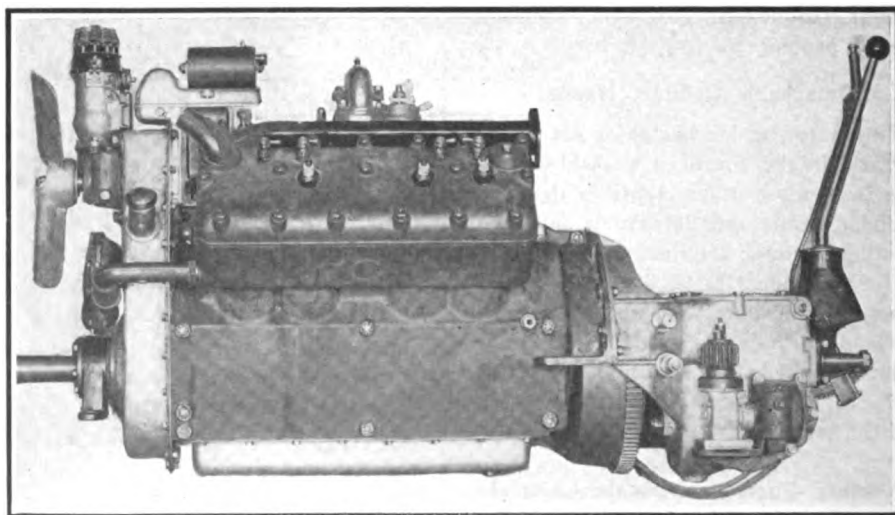
The camshaft is of the usual drop-forged construction with the cams integral. It is carried on three bearings, the diameters of the front and rear being $1\frac{1}{4}$ inch and of the center $1\frac{3}{8}$ inch. The drive for the camshaft is by spiral gear from the crankshaft, it being vertically below the camshaft. The valves are all of tungsten steel, $1\frac{1}{2}$ inch in diameter. Their lift is $11/32$ inch. The intake opens 15 degrees past upper dead center and closes 38 degrees after lower dead center. The exhaust opens 45 degrees before lower center and closes 10 degrees after upper center. This timing is somewhat at variance with that ordinarily employed with the newer eights. The firing order is 1—8, 3—6, 4—5, 2—7, considering the first cylinder on the left as No. 1, the second on the left as No. 2, the first on the right as No. 5, and so on.

The method of cooling is by a single centrifugal pump which operates in connection with a cellular radiator and 16-inch fan. The lubrication system is of the pressure-feed type with a gear oil-pump driven by spiral gear from the crankshaft as the pressure source. The oil is pumped from the reservoir at the bottom of the motor up through ducts to the main crankshaft and connecting

rod bearings, the throws being drilled to admit of this. It overflows from here to a pipe that leads to a pressure indicator and a pressure regulator and thence to a duct from which the camshaft bearings and cams are lubricated. The crank throw overflow lubricates the cylinder walls. The system operates with a pressure of 30 pounds per square inch.

Intake and exhaust manifolds are separate from the cylinder castings and are bolted in place. The carburetor is a specially-designed Stromberg, known as Model H-2, and of $1\frac{1}{4}$ -inch size. The carburetor is not hot waterjacketed, but instead there is a hot-air intake pipe.

The fuel is drawn from a 16-gallon gasoline tank at the rear of the chassis by the Stewart vacuum feed apparatus, providing gravity feed from the auxiliary tank to the carburetor. The new Cole is fitted with the latest form of Delco electric apparatus for lighting, cranking and ignition. Instead of having a combination motor-generator and ignition distributor, there are three separate units. The generator, which is driven from the camshaft by an enclosed silent chain, is placed in the V between the cylinder castings. Its reduction as compared with the crankshaft speed is 2 to 1; that is, it runs twice as fast.

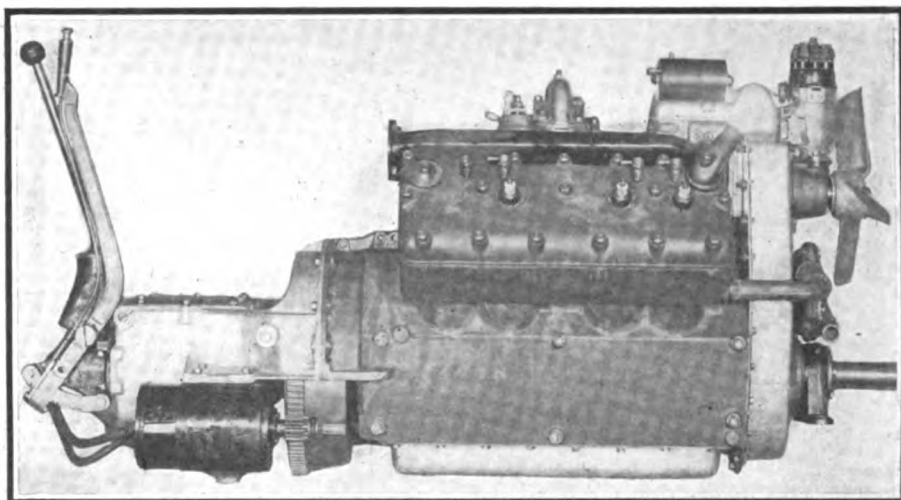


Unit construction is employed and starter drive is through the flywheel rim. The electrical system is the latest Delco with separate units for ignition, starting and lighting. Note the accessibility of the ignition distributor at the front of the motor.

The cranking motor is mounted on the side of the gearcase and drives through gearing with the flywheel teeth with a ratio of $10\frac{1}{2}$ to 1. The system operates at 6 volts, and with it is used an Exide 80 ampere-hour storage battery. The ignition is by Delco distributor. The spark control is entirely automatic and is governed by motor speed.

A feature of the motor which makes for lightness and strength is the use of pressed steel parts wherever possible. For instance, the oil base which bolts to the bottom of the two crankcase halves is a pressed steel part. The same is true of the covers which go over the valve tappets and springs, of the cover for the gearcase and of the front housing for the motor gears.

The final drive is through an open propeller shaft which is fitted with two universals. The three-quarter elliptic rear springs take the drive. The rear axle



The Delco starting motor in the Cole eight is mounted on the right side of the gearbox, driving to teeth in the flywheel rim. A feature of the motor is that pressed steel parts are used largely, giving lightness together with ample strength

is floating and equipped with Timken bearings throughout. The ratio is $3\frac{1}{2}$ to 1. External contracting service brakes

and internal expanding emergency brakes are used and act in $14 \times 2\frac{1}{2}$ inch rear wheel drums.

Buda, Regal and Abbott-Detroit Have Eights

Buda Has Staggered Cylinders and Uses Single Camshaft

AN eight-cylinder V-type motor, $3 \times 5\frac{1}{8}$, Model DEU, has just been announced by the Buda company, Harvey, Ill. It is the second eight to use connecting rods mounted side by side on the crank pins and two blocks of four cylinders set staggered.

The cylinders are at 90 degrees and in the bottom of the V is the single camshaft with eight cams, each one operating two opposite valve push rods. All the valves are on the inside of the cylinder blocks.

The new Buda is designed to accommodate a unit clutch and gearset or may be had for independent mounting. In either case the support is from three points. In the matter of weight the Buda eight is lighter than a six of the same power. The company gives 550 pounds as the weight with aluminum crankcase. The overall length is slightly over 33 inches and the width $26\frac{3}{4}$ inches, measured from the outside of one cylinder block to that of the other.

The L-head cylinders have the base flanges extended to carry the push rods, which are oiled by spray from the crankcase and are inclosed with the rest of the valve mechanism by cover plates. The cooling of these cylinders is by thermosyphon with each waterjacket so placed that the cylinder is cooled around its entire bore, around the combustion chamber and the valve seats. The inlet manifold also is jacketed.

The valves are $1\frac{11}{16}$ inch diameter

and have a working diameter of $1\frac{1}{2}$ inch, which is one-half the cylinder bore, the use of these large valves going a long way toward obtaining efficiency. The valves are enclosed by cover plates provided with openings which act as breathers.

The crankcase is of aluminum alloy. The crankshaft is mounted on three bearings. The lower connecting rod bearings are adjustable by simply removing the crankcase oil pan. This also allows of the pistons being removed without disturbing any of the other parts. A feature of the piston construction is the use of a drilled skirt which causes excess oil to drain back and thus prevent smoking.

Lubrication is by pressure, oil being taken from a reservoir in the crankcase sump by a gear pump and forced through pipes to the crankshaft bearings, whence it travels through ducts in the shaft to the crankpin bearings; the spray from these takes care of the cylinders, pistons, etc. The camshaft has direct leads from the main oil line.

The motor fires as follows:

Right side	Left side
1	4
3	2
4	1
2	3

In the matter of accessories provision is made for the mounting of either a standard magneto or some form of battery system distributor. The carburetor is mounted between the blocks with all the accessories and has a side outlet to a waterjacketed intake manifold.

Regal Has Two Connecting Rods on Each Crankshaft Throw

THE Regal Motor Car Co., Detroit, expects to have at the Chicago show the two new cars which will feature the line for the coming year. These are an eight-cylinder design to sell at \$1,250 and a small four-cylinder car at \$650. Both are to be in either roadster or touring form. The eight is a 40-horsepower car with a $2\frac{7}{8} \times 4\frac{1}{2}$ V motor, the two blocks of four cylinders being at 90 degrees on the crankcase. The usual eight-cylinder practice will be adhered to, the crankshaft having four throws and two rods connecting to each.

The small four-cylinder type has a $3\frac{3}{8} \times 3\frac{3}{4}$ block unit power plant, the three-speed gearset in unit being a new feature to Regal construction.

Electric cranking and lighting is by a single unit system, the drive being through a silent chain to the crankshaft. Other specifications include 106-inch wheelbase, $30 \times 3\frac{1}{2}$ tires, cantilever rear springs and floating rear axle.

Abbott to Have $3\frac{1}{8} \times 4\frac{1}{2}$ Perkins Motor Giving 30 S. A. E. Horsepower

Following the purchase of the goodwill, trade name and assets of the Abbott Motor Car Co., Detroit, Mich., the Consolidated Car Co. has completed arrangements for marketing an eight-cylinder five-passenger car which is to sell for \$1,685. This will be styled Abbott-Detroit and will be fitted with a $3\frac{1}{8} \times 4\frac{1}{2}$ Perkins motor. The wheelbase will be 116 inches.

Philadelphia Dealers Maintain Quarters That Are Up-to-date Clubrooms

Organization Has Progressed Steadily Since Formed 10 Years Ago

WHEN a dealers' association has proceeded along an unwavering line of existence since its formation and has grown steadily and prospered for 10 years, it takes its stand in the retail end of the motor car industry as an exception and a model worthy of emulation.

This has been done by the Philadelphia Automobile Trade Association, which is probably one of the best dealer organizations in the trade today in many respects. There are some features which have been developed by some of the other good organizations within the trade, and the Philadelphia body may never have laid claim to much limelight because of unusual doings, but it nevertheless stands out in bold relief against the dark skyline of the association world.

Of course there are not readily discovered achievements which distinguish the Philadelphia association; it is mutually protective to a high degree; it promotes a show every year, and, what is more to the point, makes money on it; it watches legislation and it has a bank account, but what strikes the newcomer with greatest force and what may truly be regarded as one barometer of the organization's success is its headquarters.

Whole Layout Unusual

In a building at Broad and Callowhill streets, in the heart of Automobile Row, are the offices of the secretary, a directors' room, an exceedingly well fitted up clubroom, and a grill room which pays for itself. This grill room is the one thing in the whole layout which is the most unusual, and it is a thing which means much. When the members of an organization are sufficiently loyal and interested to get together at lunch time in a way to make a grill room pay, the association of which they are members is bound to be successful.

The association quarters, for which the yearly rent is \$1,500, occupy the whole second floor of a modern two-story building. The interior is illustrated with this story. The fittings are not extravagant but are attractive and club-like. The lounging room at the front is one of those rooms where a man likes to



The association's rooms occupy all of the second floor of this building

stretch his legs and smoke after dinner. The grill has tables large and small, with a big round table in the center where quite a party can be accommodated.

The steward formerly was head waiter in the Broad street station of the Pennsylvania Railroad, and his services are eminently satisfactory. There is also a chef, an assistant chef and five waiters, all colored men with the exception of the chef, who is a woman.

An average of 35 men dine in the grill each day; some days there are 70. Last year the receipts were \$12,000, an average of about \$40 a day and about \$1 per man. Of import is the fact that during this same period the bar receipts were but \$33, an average of 11 cents a day,

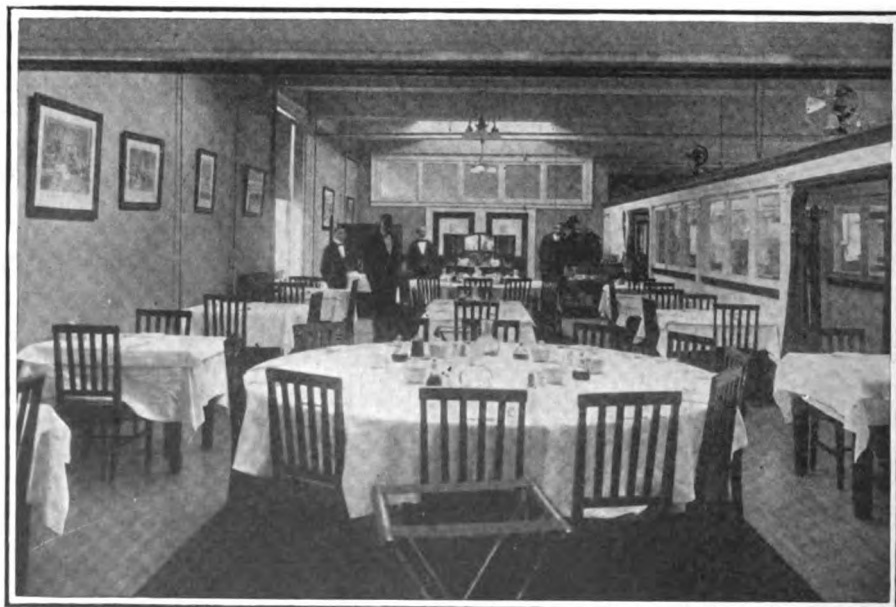
Has Balance in Bank and Runs Show That Makes Money—Works Effectively

and the average per man is too small to cover even one drink. This at once eliminates any contention that such an enterprise must depend upon a liquor license for its popularity.

When an internal revenue collector went to the rooms near the close of the year to make the Federal assessment on liquors in stock he found that the association owed Uncle Sam a quarter of a cent. It seems to prove conclusively that business men do not care to mix booze and business, during business hours, at least. And the grill, which did not always break even, did so last year.

Menu Changed Frequently

The menu is changed so that it never becomes monotonous; the steward is a master of his craft. The food is not high-priced, nor is it cheap. The intention of the management is to offer something similar to what may be obtained in the class of buffets the members would care to frequent and to do it at just a little less money. Eating at the grill is in no wise an economy, but it is eminently satisfactory. No tipping is permitted, but 10 cents added to each bill helps pay the employees good wages.



The grill room is the striking feature of the organization's activities. It is patronized daily by an average of 35 members and is a paying proposition. Secretary's offices are across the corridor at right

Across a glass-partitioned passageway from the grill room are the offices of the assistant secretary, H. Warren Terry. A member of the association carries the title of secretary but Terry does the work. He is in his office all day and is a busy man. There are two telephones on his desk—both very busy telephones. He used to be in the manufacturing business before he took up the management of the association and, he said, "I always supposed I led a comparatively busy existence, but now—" and he threw up his hands as both telephones rang at the same time and another dealer came in to see the secretary.

Secretary a Busy Man

The rooms close daily at 5:30 unless there is a dinner or meeting on; if a dinner is to be held all that is necessary is that the steward be notified.

The association has 156 members and the general good of the trade is its object. While the Motor World man was talking to Terry a member telephoned that a certain man was soliciting money along the row under false pretenses; im-



Assistant Secretary H. Warren Terry and his ever-busy telephones. His office assistant is in the outer office. The entrance to the rooms is in the far background, at the right of the white window

mediately this information was posted on the bulletin board and the organization had done one more good turn for its membership.

On the bulletin board was another notice which advised members to see the

secretary before giving any demonstrations to B. Blank. Blank, the secretary explained, is a real estate man who has been getting numerous free business trips about town under the guise of demonstrations. These are but incidents.

The show is, of course, one of the big affairs of the year, and is one of the reasons for the existence of the organization, but no opportunity for mutual benefit is overlooked. There is maintained an Advertising Committee whose membership is a secret to outsiders. To this committee must be referred all advertising plans, except newspapers and recognized journals.

Refer Ad Men to Committee

If a member is solicited for an ad in a program or anything of this kind, the solicitor is referred to the association secretary, who informs the solicitor that the matter will be referred to the Advertising Committee. The solicitor cannot visit the committee because their names are kept secret. If the committee sees merit in the proposition it is given a sanction; otherwise the solicitor might as well save his legs and his breath so far as the dealers are concerned. This plan saves members many dollars by keeping them from being forced into useless ads and at the same time releases the member from all responsibility for the refusal.

The Legal Committee keeps its eye on the law-makers. If a bill comes up and it is deemed undesirable the committee takes the matter in hand and endeavors to modify or defeat it; when the Buckman bill, which would have barred all trucks above 5 tons from the roads, was introduced in the Pennsylvania legislature a year and a half ago, the committee

LUNCHEON

SOUP

Vegetable	.15	Bouillon	.15
Consomme	.15	Mangoes	.10
Olives	.10	Celery	.15
Fried Scallops	.40		
Roast Loin Pork, Apple Sauce	.40		
Lamb Stew	.40	Country Sausage	.40
Calf Liver and Bacon	.40	Tenderloin Steak	.50
Half Broiled Guinea Chicken, Current Jelly	.65		

English Muffins

Boiled Potatoes	.10	Baked Sweets	.10
Green Peas	.10	Apple Sauce	.10
Cold Asparagus	.20	Lima Beans	.10

COLD MEATS

Chicken	.50	Tongue	.35	Ham	.30
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DESSERT

Neapolitan Ice Cream	.15		
Figs in Syrup	.20	Grape Fruit ½	.15
Baked Apple	.10	Rice Pudding	.10
Chocolate Eclair	.10	Cinnamon Bun	.10

Cheese and Crackers

SANDWICHES

Club (double deck)	.30	Chicken	.20
Ham	.10	Roast Beef (hot)	.25
Tongue	.15	Roast Beef (cold)	.15
Sardine	.20		

EGGS

Boiled	.20	Omelet, with Tomato or Ham	.35
Fried	.25	Scrambled Eggs	.25
Poached	.25	Bacon and Eggs	.40
Omelet (plain)	.30	Ham and Eggs	.40

BEVERAGES

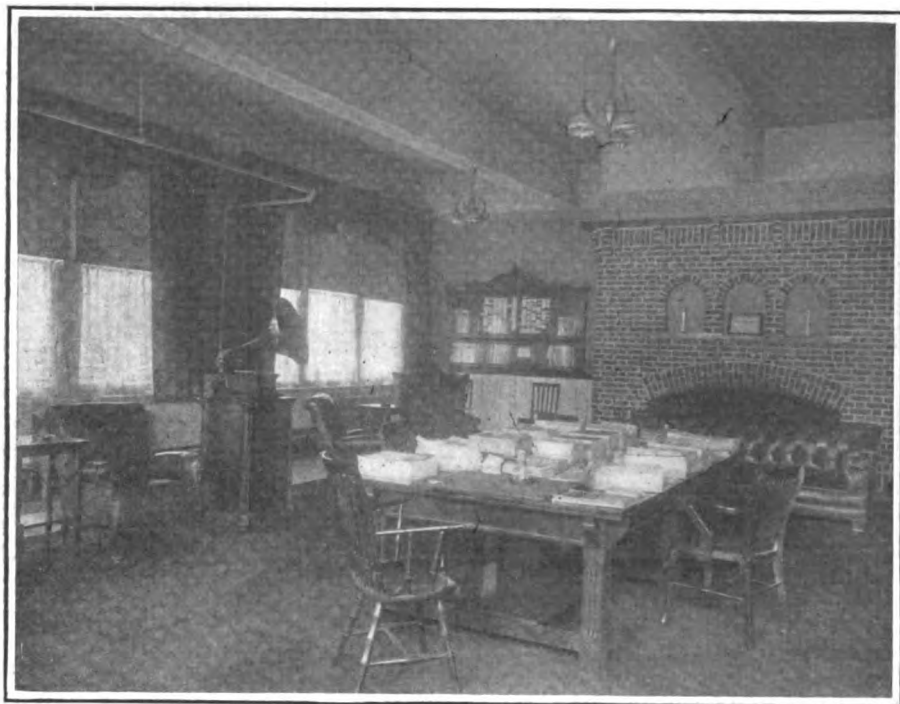
Coffee, 10c.	Iced Tea, 10c.	Milk, 10c.
Tea, 10c.	Iced Coffee, 10c.	
Cocoa, 10c.	Buttermilk, 10c.	Chocolate, 10c.

SPECIAL—60 CENTS

Roast Loin of Pork, Apple Sauce	
Baked Sweet Potatoes	Succotash
Dessert Coffee	
Stewed Breast of Lamb with Dumplings	.40

January 14, 1915

This is the association grill's menu for last week Thursday, January 14. The sandwiches are a standing list; the luncheon is changed daily. The special in the lower right corner is provided during busy weeks, such as show week, when diners are anxious to eat as quickly as possible



The association's lounging room, which fronts on Broad street, is as cosy and comfortable as any clubroom. On the table are all the current trade papers

succeeded in its effort against some of the features. Once a year a get-together outing is held.

Membership is of three kinds—active, associate and contributing. The active members are the representatives of the member dealership concerns; each active member gets one vote. Association members are accessory and tire dealers. Contributing members are the employees or additional members of member dealer companies. These may not vote.

The association meets quarterly and the Board of Directors monthly. This board also constitutes the Show Committee. The officers are: President and chairman of the board, William P. Herbert, Chandler Motor Car Co.; secretary-treasurer, J. E. Gomery, Hudson, Gomery-Schwartz Motor Co.; other three directors, E. C. Johnson, E. C. Johnson Co., Reo; Ralph W. Cook, Girard Automobile Co., Peerless; Edwin B. Jackson, Packard Motor Car Co. Cooperative buying is not attempted.

Show Space Limited

Every exhibitor gets 400 feet of space unless he sells two makes of cars, when he may have 600 feet of space; this, however, does not mean that the dealer must show both lines. He may show only one, and several utilize their space in this way, pushing the car on which they deem it best to concentrate. The Locomobile branch profited by the failure of Stevens-Duryea to show, the former being permitted to use the Stevens-Duryea space next door.

STARTS EARLY ON SHOW JOB

Philadelphia Association Makes First Move in September— Plans That Are Made

EVERY group of dealers which ever had to stage a show is interested in how other dealers stage their shows. This is how the Philadelphia Automobile Trade Association does it and makes money on the exhibition:

The first move is at the September meeting, when the subject is brought up and a show committee is named; this generally consists of the Board of Directors—five men. This committee meets at luncheon in the grill room and at other times, but the grill furnishes an excellent opportunity for getting together with frequency.

The next move is to engage a building and settle on a date. Getting a building is somewhat of a problem because good show buildings are a scarcity in Philadelphia.

Then comes the decorative work. Prior to this year the committee asked decorators to submit schemes and estimates, but this was regarded as allowing the decorators too much leeway; the association never could be sure it was getting the most for its money, so this year it had an architect draw up a scheme

of decoration and the decorators were asked to submit bids, each man bidding on the same thing. This permitted a good price for the work, the specifications of which had been fixed by the association.

An advertising poster is necessary, of course, and to obtain one the committee inaugurated a contest with a \$50 prize. The conditions were that a certain wording should be used and that the scheme should include good display features. The results were gratifying and the winning poster was very satisfactory.

The show program was written by John A. Cleary, an advertising man. The whole job was turned over to him; he wrote the show copy, solicited the ads and handled the details. At that the program pays a profit, which is divided among the association members who advertise in it. They may theoretically take a chance on getting their money back, but the chance is negligible and most of them advertise.

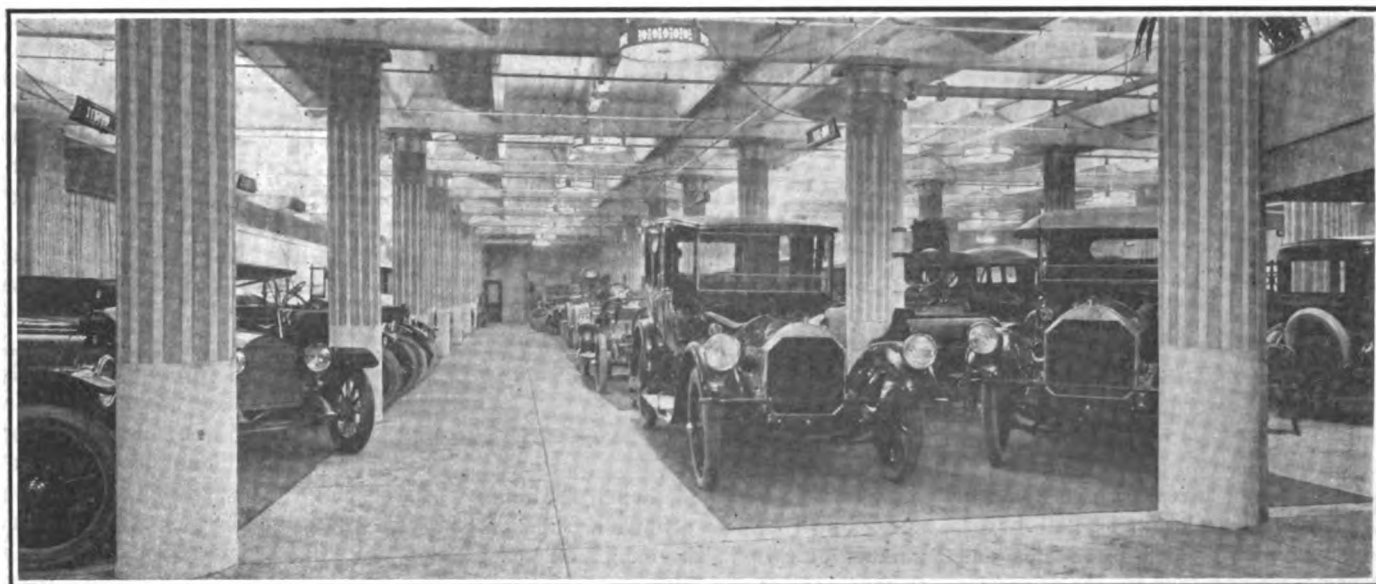
The floor of the exhibition building is laid out in spaces, the divisions being slightly in excess of the number of members. On a certain night the members meet, all the names are put into a hat and the space award is by drawing. Each member in the room has a blueprint of the floor and as his name is called he picks his space; the secretary records the selections.

A curious procedure is that some of the dealers have what they consider "lucky spaces" and believe them especially conducive to sales, basing their belief upon previous show results. After the members have been provided for, space is allotted to outsiders.

The ticket job is given to a printer on estimate. Passes are numbered and distributed among the members; each member is supposed to sign all those he gives out, but in case he does not the secretary finds it possible, though laborious, to check them up from the numbers. Each member must pay 50 cents for each of his passes that is turned in at the door of the show.

Exhibitors are given a round tag, which attaches to the lapel of a coat; upon leaving the building each exhibitor displays his tag and gets a return check and upon reentering displays his tag and surrenders the return check as at the national show.

Space was charged for this year at \$1.25 a square foot. Each member with a one-car agency was allowed 400 feet; two-car agencies were allowed 600 feet. This made a one-car man's bill \$500; if he is not a member of the association he gets none of this back.



Despite the low ceiling and the congestion the Philadelphia show was not lacking in attractiveness. The posts were done in blue stripes and the lamps were covered with art shades whose flatness fitted in with the broad extent of the show floor. in the right foreground, Stutz at the left

The posts were done in blue stripes and the Foss-Hughes, Pierce-Arrow, occupies the space

Philadelphia Makes Money on Show

Paid 125% Last Year—Series Unbroken Since 1902— Good Business

THE Fourteenth Annual Motor Car Show of the Philadelphia Automobile Trade Association was held last week, and in connection with it two things stand out. They are:

1—The show is a money-maker. Last year it paid the association members 125 per cent on what it cost them.

2—The shows have been held in an unbroken series since 1902, which is but one year behind the National Automobile Chamber of Commerce's national New York and Chicago exhibits.

What is possibly a third point is that the show is promoted by one of the solidest and best motor trade organizations in the country—which is a whole story in itself.

No Good Building Available

The show was held in the Metropolitan building, at Broad and Wallace streets. There were 57 exhibitors, not one of whom had all the space he wanted. The city has no good exhibition building, and the cars were badly crowded, a thing the association will seek to remedy.

The Philadelphia show is a territorial exposition. It is THE show for the eastern half of Pennsylvania, lower New Jersey, all of Delaware and much of northern Maryland. Eastern Pennsylvania is the largest territory from which the show draws. In all this section there

are few shows of consequence. Harrisburg, 104 miles out, has an exhibition; Lancaster, 60 miles away, and Bethlehem, 50 miles from Philadelphia, are considering staging exhibits this winter; Scranton, 130 miles north, has one scheduled for February 1-6, but few such shows are held with regularity, and, anyway, they are all outranked in general interest by the Philadelphia exhibit.

Philadelphia's show always follows that in New York; it opens the same Saturday night that the New York show closes; for the opening night the association members this year distributed 35,000 free tickets, and according to the crowd, says Secretary H. Warren Terry, "they were all there."

This crowd does not include good prospects: the dealers see to that. The 35,000 tickets are given to chauffeurs, boys and girls and anybody but a good prospect. This fills the building to the doors on the opening night and makes excellent material for a good Sunday newspaper story. Of course, many of the best exhibits are not in place that night, but this is part of the plan.

It is planned to show many of the special exhibits which were used at the preceding New York show; these are rushed out of Grand Central Palace after the show closes Saturday night, are loaded onto special trains on the Pennsylvania and Philadelphia & Reading railroads, are taken at express speed to the Quaker city and are placed in the exhibition building Sunday. When the show opens Monday morning at 10:30 everything is ready and the good business

crowd makes it first appearance that day.

From then on the show is what might be termed a hummer. An orchestra at each end of the long floor plays during the afternoon and evening; a good buying crowd throngs the floor; retail sales are good; dealer business thrives; Automobile Row is well decorated; the newspapers donate columns of publicity and the dealers use yards of ads; everything moves with a swing and a dash and the cash taken in at the door more than pays the expenses of the show. When it is all over everybody is happy.

The dealers are well satisfied for two reasons. One is that most of them have done some good business. The other is that even if they didn't get a prospect or make a sale the show hasn't cost them much of anything and they have helped stimulate the trade generally.

What Do You Say?

Does a show ever bring in much of what may properly be termed "new business"? By this is meant sales to prospects who were not prospects when the show opened, but who turn up at the show, evince an interest and buy during the show.

Fred Wadleigh Nichols, Eastern district manager for the Hupmobile, says "No." Some others dispute him, and Motor World would like to hear from others.

Nichols maintains that if the shows were not held the volume of business during the year would not be greatly affected. His stand is that the man who buys at the show had a preconceived liking for some particular car. The other result of the show is that the prospect

may develop at the show a liking for some particular car and make himself eligible as a prospect.

But, he says, there are few sales which are made by people who make up their

minds to buy after reaching the show. Several exhibitors disagreed with him on this score, maintaining that the show did develop new business and citing concrete evidence.

Quaker City Show Brings Business

**Always Frequented by Good Buying Crowd—
Caters to a Large Territory**

AT the show there are two kinds of business—dealer and retail buyer. These may be divided into sales and prospects, making four groups of results to be obtained from the show.

The Philadelphia show is always a good buying show; numerous retail sales are made. It is, of course, the dealers in lower-priced cars who do the greater business in numbers, but the money volume is about the same.

Cars like Pierce-Arrow, Packard, Peerless, Locomobile and White may sell from 3 to 6 cars a week; in fact, these seem to be near the figures, although the dealers hesitate to disclose the exact amount of business done. A little lower down the price scale—Studebaker, Cadillac, Jeffery, Cole and others—the number is 8 or 9, and when it gets down to the Ford, which enters the show, the sales run up as high as 10 or 15. At that, the money showing is with the higher-priced cars, for 10 Fords at \$500 are equalled by one \$5,000 Packard or Pierce-Arrow.

Then there are the prospects secured. Their number depends entirely upon the aggressiveness of the dealer and his salesmen. The salesman whom the Motor World man saw slinking behind a car enjoying a smoke probably won't roll up a very big average, while one aggressive Stutz man said he expected to have more than 100—and his method of working lent color to his statement.

Real Sales Are Result

Most of the dealers place great value upon the prospect end of the show; many of the leads developed here terminate in real sales; some of them are closed at the show, and there is in some quarters a considerable portion of new business; that is, people who make their first appearance as a prospect at the show and buy before the show closes.

In this connection all the Philadelphia dealers work at both the show and the salesroom; few, if any, of them have a

rigidly laid out plan of hours of attendance, but there is always a sufficient number of men in the exhibition space to take care of the business. Generally one man is left at the salesroom, and in several cases this man has landed some good business. If it is necessary for any purpose a salesman at the show will take a prospect to the salesroom in a demonstrating car to help the deal along.

As to the dealer business, the manner of procedure is somewhat different; a dealer cannot appear and be signed up at once. Many of the Philadelphia dealers are also distributors over a big territory and are anxious to appoint subdealers, but the man who turns up at the show as a prospective subdealer must be investigated before he can get an agency. This generally takes days or weeks. On the other hand, men who have been nibbling at the subdealership hook are signed up at the show if they will do so.

Coal Country Buys in Winter

The Philadelphia distributors have in their territory what is both an advantage and a disadvantage. It was explained by the wholesale manager of the Oakland branch, who said several subdealers had been signed up in the coal district. In this territory, he said, wintertime is moneytime with the coal people, wherefore the subdealers in that section are best able to move cars in the winter when the season is at its slackest in Philadelphia. This helps even up the distributor's business. But when summer comes the coal country subdealer has his slack season and does not keep pace with the big city business. On the whole, however, it evens up well.

A marked feature of the show business is the interest in enclosed cars. The demand for them is greater than at any previous show or during any previous season. The dealers account for this situation by the explanation that there is, as in any business, a natural normal growth, and that the enclosed car busi-

ness also is making rapid progress. It is noticeable in those lines which are featuring attractive layouts of sedans, coupes and cabriolets; especially noticeable is the hit made by the Ford sedan and coupe. These models were the centers of attraction in that exhibit, although a touring car was displayed.

The new cars, such as Dodge Bros., Scripps-Booth and Briscoe, were always surrounded by crowds, as were the new eights.

The electric men are not especially optimistic. They state that this trade is not making an over-satisfactory progress in Philadelphia, although they are not retrograding. One reason, they state, is that there is a large touring population in Philadelphia which prefers a gasoline car which will make long overland runs.

DEALERS' DINNERS FEATURE OF WEEK

Program Much the Same as That Pursued at Greater Metropolitan Exhibit

As at the big New York show, there were several dealers' dinners in Philadelphia during show week.

The Tioga Automobile Co., Hupmobile, entertained its subdealers and several factory men at the Majestic Hotel Wednesday evening.

The Automobile Sales Corporation entertained the Cadillac dealers Wednesday evening in the Directors' Room of the association at Broad and Callowhill streets; the Hess-Bright Mfg. Co., entertained Monday evening.

The Gomery-Schwartz Motor Car Co., Hudson, gave a dinner at the Bellevue-Stratford Wednesday evening. The guests of honor were Sales Manager C. E. Morse, factory; C. C. Winningham, director of sales and advertising, factory; A. J. Crumley, district manager, Philadelphia, and Samuel S. Toback, president of the A. Elliott Ranney Co., New York.

The tables were in the form of a triangle—the Hudson mark—with 15 men on each of two sides and 20 on the third. There were several addresses.

The Studebaker affair was a luncheon Thursday noon at the Hotel Walton, by the Studebaker branch. Vice-president and Sales Manager E. R. Benson, factory, was the principal speaker. He gave an optimistic retrospective and prospective talk on conditions and pointed out the prosperity which is destined to come to America and American dealers. He emphasized the progress made during the past year; 77 covers were laid.

TRIM FRONTS FOR THE SHOW

Dealers Beautify Salesrooms by Profusion of Flowers Dur- ing Exhibition

THE windows along the row were well trimmed for the occasion; some of them stand out as examples of careful attention to window decoration.

The Regal Sales Organization had a car in a gilded picture frame; the floor of the picture was of sand and imitation grass, while the background was painted canvas scenery.

The Mercer Co. of Philadelphia not only decorated its window and show-room with palms and ferns, but erected a new electric sign on the roof of its one-story building. The sign, a Mercer shield with "Mercer Cars" in the center, is visible from nearly to the City Hall.

The King branch secured a dainty effect with a little row of potted ferns along the bottom of the window.

The Detroit Philadelphia Co. had placed a car in the window, surrounded it with white pillars, spread green grass upon the salesroom floor and added several touches of greenness here and there; it was a pretty setting.

Potted ferns were placed all through the Chevrolet salesroom. The Packard branch used large palms and boxwood trees, and the Chalmers salesroom, when lighted at night, was one of the best along the row. Cut flowers were used in profusion and a decorator had transformed the room into a bower.

Ferns were effectively placed by the Roman Automobile Co., new and used cars, and the Buick window, of cut flowers and leaves, was attractive.

Oakland had a log fence with rustic scenery and back of it a chassis with ribbons running to an explanatory sign-board above it.

A miniature country road ran along the base of the White Co.'s window, and Cadillac had a single vase of flowers on a table in the center of the room; it was simple but added a clever touch.

White Follows With Truck Show

Following the regular show the White Co.'s branch is holding a truck show in its salesrooms, 216 North Broad street. The pleasure cars have been removed and the private show is being conducted with invitations and all the earmarks of the association exhibition.

About 25 trucks are displayed. These are vehicles which have been ordered for delivery early in the spring and represent nearly all the common lines of commercial car service from an ambulance to a sand truck. The show is held at this time for two reasons. One is that it follows the regular show with its show-time atmosphere, and the other is that it is possible to induce buyers to hold back on deliveries for a few weeks and thus permit the accumulation of enough trucks for a good showing.

Scored on Terry—Almost

A. E. Maltby, the Winton manager, put one over on H. Warren Terry, secretary of the association—for one day.

There is a rule that no signs shall be displayed on the cars exhibited. Maltby wanted to show the price of the new Winton light six. He had a sign made in imitation of a license plate, but in place of license numbers he had the price of the car, minus any state initials.



This little yellow ticket, which is a catchy way of telling the story of the new Regals, was handed out at the exhibit of the Regal Sales Organization by C. H. Miller, Jr. Unlike many advertising stunts, few of them were thrown away. Seldom was one seen on the floor

This he suspended between the front ends of the chassis frame.

Monday evening Terry came along. He stopped, looked at the sign and looked at Maltby.

"Maltby," he said, "there's more than one way to get around the devil, isn't there?"

That was all. The sign disappeared.

Dozen Branches in the List

Of the something like 60 car representations in Philadelphia, about a dozen are branches; they are: White, Stanley, Ford, King, Packard, Oakland, Locomobile, Studebaker, Oldsmobile, Winton, Chevrolet and Buick.

Featured Short-Time Storage

Across Broad street from the Metropolitan building, where the show was held, the S. & F. Auto Co. stored cars for show visitors for 50 cents and had a sign to this effect in the window.

GETS A HOST OF PROSPECTS

One Salesman Says Show Is Worth All It Costs—Made Exceptional Record

JUST how J. J. Kane, Jr., of the S. R. Blocksom Motor Car Co., Stutz and Lyons-Knight, will score this year cannot be told for some time, until the returns have been counted, but his record in 1911 at the show seems a record indeed. Kane is a firm believer in shows and their value.

At the 1911 show, when the Kissel was new at the exhibition, he secured more than 100 prospects. This he pruned down to a list of 58; out of the 58 he sold 24, a batting average of about .500. He said he expected that 20 out of every 50 prospects secured at this show would net business.

Kane is energetic in his show work. Chances to do business are never put off until next week, when the show is over. If possible he gets to the prospect immediately, looks over any car which is offered in trade, and does everything possible to close the deal at once.

In securing names of prospects it is always his policy not to annoy the prospect if so requested. "Very often," he said, "you may have occasion some time later to run up into this man's neighborhood and he seldom resents a telephone call asking him if he won't look out the window to see the new car. Generally he will do this—and come out on the street to look at it—or will make an engagement for some other time. If you have respected his wishes about not annoying him your chances are much better than if he is persistently followed up."

Two New Agency Companies

The Milburn Electric Car Co. was formed in Philadelphia about three weeks ago and made its debut at the show last week. It is handling the product of the Milburn Wagon Co., Toledo, O., which recently entered this line of manufacture. The dealer is located at 2212 Spring Garden street; the manager is Rodney S. Pullen, a cousin of Eddie Pullen, the Mercer driver; Pullen formerly was with the Baker and Detroit electrics in that city and before that was an electrical contractor.

The Briscoe, another new car, is handled by the Briscoe Motor Distributing Co., M. J. Roche, manager.

Where 1,000 Batteries Are Charged At Once

**Willard Station in Chicago
Cares for Nine States**

**Quick Service to Dealers and
Owners a Features**

WITH the advent of things electrical in the motor car the storage battery has assumed an important role, and the service system necessary to assure satisfaction to battery owners has become a business in itself. To obtain the best results battery makers have found it advisable to establish commodious stations in the larger cities to care for surrounding territories.

One of the largest stations of its kind is the newly-erected Willard service branch at 2524 Wabash avenue, Chicago. This station, which supplants the previous one of much smaller capacity, is used to repair, charge and build Willard batteries for car owners, dealers and all who may require the service.

12,000 Feet of Floor

The new Willard service branch comprises a one-story building of approximately 12,000 feet of floor, and of this approximately 9,000 is devoted to the building of vehicle batteries and the repair of ignition and lighting accumulators, 2,000 feet for stock and 1,000 for the offices. In all, 21 men are employed in the battery and stock rooms, and 9 in the office.

The battery room, in charge of James S. Shutes, is divided into three parts, the charging section, the repair department and the service division. In the former there are six wooden charging benches using glass insulators. These benches are fed by leads from the charging board, the leads being enclosed in heavy iron conduit. The charging board, made by the Leonard-Bundy Co., Cleveland, is large enough to care for 1,000 cells. The current supplied to this board is 110 on one side and 220 volts on the other, both being direct. The rheostats are of the wire type.

No Work Is Done at Night

This department is cared for by 5 men, who not only charge the batteries but remove and replace them in cars which happen to come into the station. No work is done at night and those batteries on charge are fed at a low rate so that no watching is necessary.



General view of the new Willard service station in Chicago, showing part of the 12,000 square feet of floor space and the arrangement of the battery charging and repair benches

On the opposite side of the room is the repair department, separated from the charging portion only by an aisle and a number of racks used for keeping repaired batteries and those awaiting an adjustment.

In the repair department proper are seven repair benches, each 12 x 3 feet, and cared for by four men, who are in charge of a foreman who acts as inspector of the work done. Here batteries which have been brought in to be repaired are disassembled, inspected, repaired and reassembled and then placed on charge on benches across the room. The water used for solution is made in the repair-shop by a simple distiller hung from the wall. The acid used is purchased. Besides repairing used batteries this department builds electric vehicle batteries on order. No ignition or starting and lighting batteries are made here, the Cleveland factory supplying made-up batteries for the stock room.

Can Handle 1,200 Battery Repairs

More than 1,200 battery repairs can be handled in this department, and while it has not been taxed to the limit during its short existence, the figure given is a rough estimate of what is being done.

The stockroom is separated from the repair-shop by a wire partition. This room contains parts of all Willard batteries and also made-up batteries, which are placed in racks fitted with charging plugs, so that the stock batteries can be kept on charge. These are given a slow rate, so that not much watching is necessary, but periodically a man inspects them and removes any fully charged.

Opposite this stockroom is an employees' room, which contains numerous

lockers, wash basins, toilets and a shower bath. At the extreme rear of the building is a small portion set aside for cars which are driven in, and the overflow from this part goes to an alley in the rear, which is not used for traffic.

In order to provide efficient lighting for the work rooms the ceiling has a number of skylights, and artificial light is obtained by the use of 100-watt tungsten lamps placed every 10 feet and operated by a cord so as to eliminate the trouble caused by looking around for a switch.

Station Cares for 9 States

This new service station takes care of nine states: Illinois, Minnesota, Northern Michigan, Iowa, Nebraska, North and South Dakota, Missouri and Wisconsin. These states are constantly traversed by two men, N. G. Wolf and P. H. Gribben, who call upon the dealers, factories and agencies and see that Willard service is up to standard throughout the territory. Besides these service men, with offices in Chicago, there are three others, one with a permanent office in Kansas city, another in Omaha and the third in Minneapolis, the latter being new and just about to be established.

Plans Tour for Cole Owners

J. J. Cole, president of the Cole Motor Car Co., Indianapolis, has planned a transcontinental tour for Cole owners to the Pacific Coast. In this work he is receiving the cooperation of the officials of both the San Francisco and San Diego expositions and also the aid of the various highway and good roads associations throughout the country. Twenty Cole owners already have signified their intention of making the trip.



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"Motor World Guide"

Specifications of leading cars to be published each week in Motor World, revised from issue to issue, and brought up-to-date weekly.

KNOW YOUR BUSINESS, KNOW THE CARS YOU SELL, KNOW THE ACCESSORIES YOU SELL, AND LAST, BUT NOT LEAST, KNOW THE CAR THE OTHER DEALER SELLS, ITS VIRTUES, AND ITS WEAKNESSES.

There is no more potent factor at your hand when making a sale than a thorough knowledge of what you are trying to sell. You may not have to use this knowledge in making every sale, but the possession of it gives you confidence and leaves your mind freer to study the attacks of the buyer, and correspondingly prepares you to convincingly meet his different arguments.

To make this car knowledge easier, to put it at your elbow, Motor World publishes this week on pages 42 and 43 its guide—"MOTOR WORLD GUIDE." There are two full pages of it, pages of car specifications, of the leading cars on the market, which you and your rival dealers handle. These specifications include cylinder dimensions, ignition, carbureter, wheelbase, tire size, prices; in short, the major specifications that a dealer and his selling force should know.

THESE PAGES ARE NOT FOR THIS WEEK ONLY. BUT WILL APPEAR EACH WEEK. FROM ISSUE TO ISSUE THEY WILL BE REVISED TO DATE. NEW MODELS ADDED, AND CHANGES IN OLD ONES INCLUDED.

This "Motor World Guide" will constitute an invaluable asset to all salesmen, and should become the

ready reference each week for the retail car industry. Each salesman is better fortified for his day's work with this information in mind. Many a car sale is closed by the confidence instilled in the buyer by the knowledge of the salesman.

To the salesman the guide can be what the table of logarithms is to the student, a great power for doing things and obtaining results.

To the car salesman this weekly MOTOR WORLD GUIDE serves a similar purpose to that of the daily stock market quotations. Knowledge of conditions and prices is one of the great qualifications in merchandising. Ignorance is inexcusable in the car salesman, yet how few salesmen can quote off-hand the prices on a score of different models, some of which come within the price zone of the car he sells and others which fall just outside of the margin?

It is just as essential that the dealer and his selling force be familiar with the facts enumerated in MOTOR WORLD GUIDE as it is that our schools insist on examinations at certain seasons of the year to make sure the pupils are qualified to receive certificates.

The Whirlwind

THE present days are epochal to the dealer. Each week brings the announcement of a new eight-cylinder motor or a new eight-cylinder car, and one is almost forced to ask before breakfast: "What important developments have taken place since yesterday?"

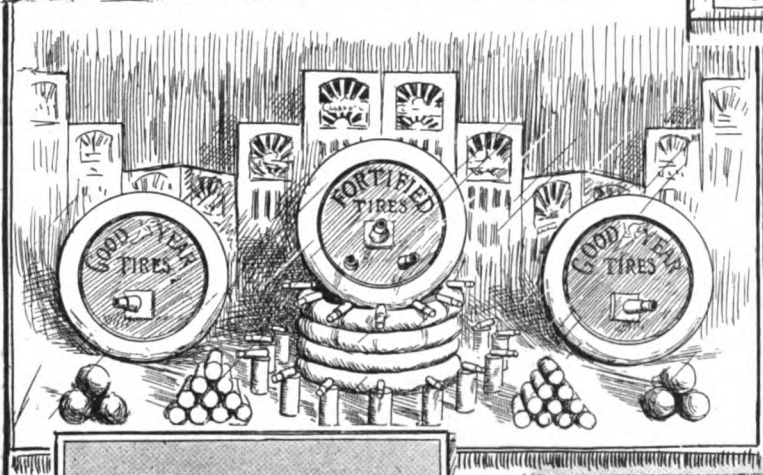
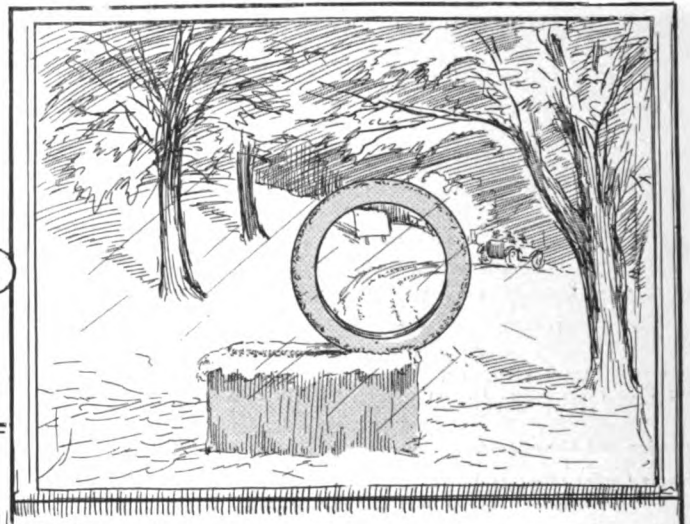
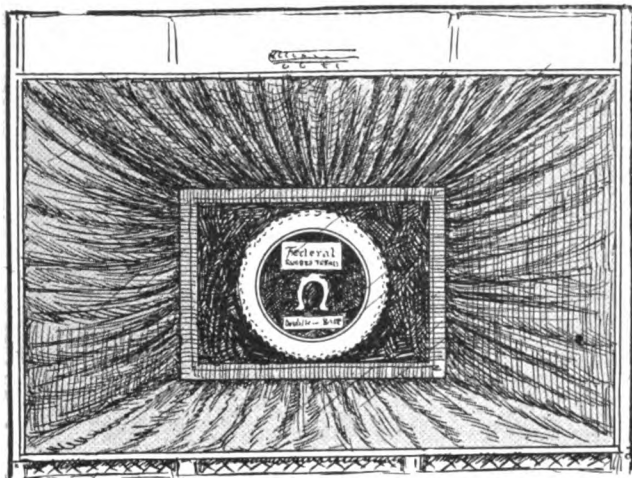
These sudden changes in manufacturing policies mean much to the dealer. Every eight-cylinder announcement made at this season of the year, when the dealer is stocked up with four or six-cylinder cars to sell, means so much additional ammunition in the hands of the other fellow, and so much additional effort and concentration needed by the dealer to dispose of the cars he has already contracted for.

The dealer cannot close his eyes to this changing period. He cannot muffle his ears in the hope of escaping the tramping sound of new forces marching into the industry. He must keep his ears to the ground in order to best interpret the vague rumblings which, sooner or later, will take definite shape. He must attend to every symptom that will aid him in getting an accurate estimate of the public pulse.

MANUFACTURERS ARE BUILDING EIGHTS, AND DEALERS MUST SELL THEM.

The dealer is the man next to the buyer. He, it is, who must be depended upon to gauge the public demand. He must find out if he can sell eights for 1916, and if so, in what quantities. He must find out what types of sixes will be most marketable next fall. He must find out the relative importance of four-cylinder cars next fall. His very existence depends on his accurate estimate of what the public will want ten months hence. It is no child's job. It is the work of an artist. It is the work of a business man, who must get his fingers on as many of the industrial pulses in his locality as possible.

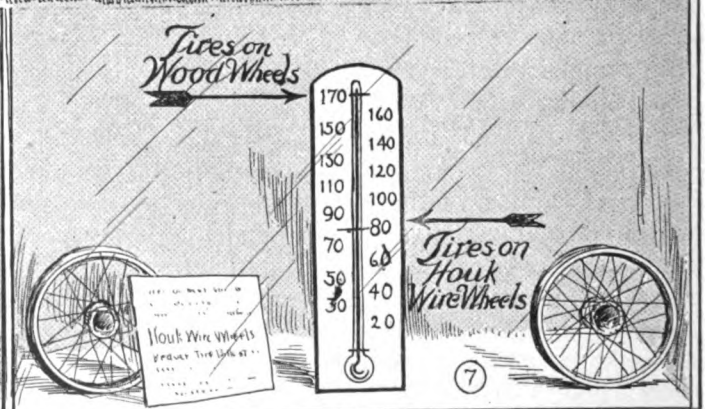
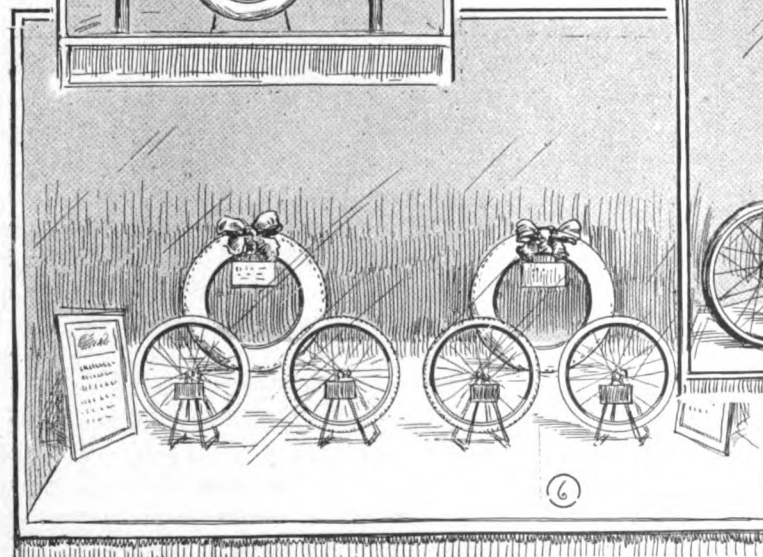
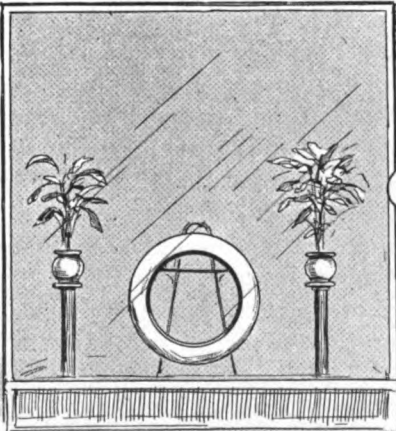
Broadway's Show-time Tire Display Methods



1—The Lowe Motor Supplies Co. placed a single Federal tire in a framed shadow-box with lights at the base. The whole was set at the back of a purple background of cloth

2—The Firestone branch used a painted drop from the factory with a glass cake of ice, colored with epsom salts and stale beer

3—Goodyear's fortified window. Horn bulbs are cannon balls; the small cannon are tire gauges, and the larger shells in the foreground are tube cartons



4—The Rutherford display was strong because of its simplicity

5—Swinehart's showing tells its own story

6—Pennsylvania's window showed two car and four bicycle tires; simple, clean-cut and effective

7—The card explains why wood wheels cause a tire to heat more than do Houk wire wheels. The big thermometer is both an argument and an attention-getter

Dealer's Legal Status

If a Minor Purchases a Car and After Becoming of Age
Decides He Does Not Want to Keep It He Can Sue
for the Recovery of His Money and Will Get It

By George F. Kaiser

In the legal department of Motor World under date of July 15, 1914, the matter of a minor's responsibility for things other than necessities was taken up. It was explained that if a minor bought a motor car or directed that a car be repaired or overhauled it would be optional with him when he became of age whether he should ratify the contract and pay his bill or disaffirm the contract and sue to recover back any money which he might have paid before that time.

It was also explained that the best way to dispense with that possibility would be to deal directly with a minor's parent or guardian; that is, doing the work on the credit of the parent or having him guarantee in writing the payment of the bill.

Typical Case in Point

A recent case has just been decided by the Supreme Court of Michigan on almost the exact state of facts set out above. A young man visited a garage in Saginaw, Mich., and purchased a used car, for which he agreed to pay \$300. He paid \$5 deposit and on arriving at his home obtained \$295 from his guardian and gave it to his brother, who paid the balance of the purchase price and drove the car home.

A short time thereafter the young man concluded that he would like to trade in his car and get another. He wrote to the company from which he had purchased the first car, and, on receiving an encouraging reply from it, he again went to Saginaw, taking along an acquaintance who could drive, and turned his first car in for another, paying \$75 additional.

Signed Retail Car Contract

On each of the occasions that he bought a car he signed a retail car contract which was prepared by the salesman of the motor company.

A month later the young man became 21 years of age, and a short time thereafter he disaffirmed his contracts, re-

turned the last car he had purchased and demanded that his money be returned to him. The motor company naturally refused to return the money, whereupon suit was brought to recover it.

The case was tried before a jury, which gave the young man judgment for \$375 and interest. The motor company appealed the case, but the Supreme Court of Michigan held that the judgment against it was proper.

Guardian's Consent Immaterial

It appeared that the contracts were made with the knowledge and consent of the young man's guardian, who furnished the money with which he paid for the cars. The motor company contended that because of this fact the contracts were really made with the guardian and were therefore valid; but the court refused to accept this theory.

At the time the first car was traded in and the second car was purchased, the salesman of the motor company called up the guardian and told him that the boy was at his garage and that he had found a car which suited him and which would cost \$75 more. The guardian said the boy might as well have it if he wanted it and that he would send the \$75.

THE SUPREME COURT DECIDED THAT THIS TELEPHONE CONVERSATION WAS NOT MATERIAL AS AFFECTING THE YOUTH'S RIGHT TO RESCIND THE CONTRACT AND TO GET BACK HIS MONEY.

The decision in this case, although hard on the dealer, was undoubtedly a proper one. There is nothing in the court's opinion to show in what condition the car was at the time it was tendered back to the dealer.

Even if it had been misused, abused or even destroyed, the right of the minor to recover back the money he had paid would not be affected.

That part of the law which deals with contracts with minors is very technical. It is the intention of the law, of course,

to fix matters so that unscrupulous persons shall not take advantage of young people who have not yet reached the age of majority.

Unfortunately, however, oftentimes it works out in such a way that it is possible for some young man, or woman, who is unusually sharp, to use this safeguard which has been thrown about minors as an excuse for not paying some just bill for which full value as been received.

In a case like this it is possible for a person under age to purchase a motor car, use it four or five years, or until such time as it no longer pleases him, and then sue and get back the money.

THE ONLY WAY A DEALER CAN PROTECT HIMSELF FROM AN EXPERIENCE OF THIS KIND IS TO BE CAREFUL WHOM HE SELLS A CAR TO, OR FOR WHOM REPAIRS ARE MADE.

If the person desiring to purchase a car, or to have work done, appears to be under legal age, it will be well worth while to make an investigation, or even to lose the contract, rather than to go blindly ahead and afterward be obliged to pay back the money received, in exchange for a badly battered used car.

Car May Be a "Necessity"

Of course, the law has made a provision as to what articles an infant is liable for. These are commonly called "necessaries" and might be said to include food, clothing, etc., which are suitable to the infant's station in life.

Under this provision a motor car might, in some instances, be a necessary. In order to be such, however, it would seem that the infant purchasing it should be either a millionaire or be so close to it that the lack of a motor car would be so unusual among persons with whom he was socially intimate as to impose a hardship upon him.

As a usual thing the young men coming to dealers are not either overburdened with money or in such absolute need of a car as to make its absence a hardship. The dealer will do well then to exercise due care as regards the persons whom he sells, and in the absence of some party who agrees to guarantee the payment of the account in writing, will do better to forego the sale.

Oral Agreement Ineffective

A written sales agency contract containing nothing forbidding the principal to make sales is not varied or contradicted by any oral agreement with regard to commission on sales. (White vs. White, 149 N. Y. S. 960.)

Many New Electric Trucks Swell List

Five Makers Added to Field and Dozen New Vehicles Put in Appearance—Industrial Vehicles a Factor

AMONG the many features which revolve around the electric commercial vehicle industry, two stand out more prominently than the rest. The first of these is the increase in the number of makers and models that have put in an appearance during the year gone by and the second is the increase in the number of electrics for indoor operation—industrial trucks they are called.

At present there are no less than eight of these industrial trucks—the Automatic, the Cowan Transveyor, the Electromobile, the Elwell-Parker or Buckwalter, the G. V., the Hoagland-Thayer, the Hunt, and the Mercury Pullem. They

range from 1 ton to 2, and tractor models are also made.

One of the most interesting is the Cowan Transveyor, which employs a novel type of elevating platform which permits it to load and unload itself.

Other interesting new vehicles are a new 5-ton Baker, the Beardsley ½- and 1-ton California-made vehicles whose battery boxes are arranged to elevate from the ground; a new three-wheeled Couple-Gear tractor; two stepless Field buses, of 18 and 38 passengers capacity, respectively; a new worm-driven 1,000-pound G. V., heretofore experimental; the worm-driven gasoline truck type Old

Hickory, a departure by the makers of Urban trucks; the low-priced Voltacar, the new \$575 Wagenhals three-wheeled electric; the 750-pound Ward, which sells for \$875 complete; a new 1,600-pound Waverley, and the new Dunlap.

Losses sustained in 1914 are few. The Bailey electric truck has been discontinued, all Bailey models for 1915 being of the passenger carrying type. The Anderson Electric Car Co. has reduced its models from three to one, of 2 tons capacity. The Fritchle, like the Bailey, is no longer made in commercial models. The Van Auken truck is now the Connersville.

Buyers Guide to 1915 Electric Commercial Vehicles

TRUCKS UNDER ½-TON CAPACITY

Name and Model	Lead Capacity in Pounds	Price of Chassis	Wheelbase	Battery Make	Ampere-Hour Capacity	Mileage per Charge With Load	Final Drive	Feature
Voltacar.....A&B	500	.....	68	Edison.....	158	.....	Top wm.	Worm drive
Wagenhals.....	600	575-c	56	Exide*.....	165*	25*	Sing chn.	Price
Ward.....WJ	750	875-c	88	Opt.....	100	35	S-bevel.	Price
Waverley.....	600	1,600	87	Opt.....	165*	50*	Herring.	Herringb. drive

TRUCKS OF ½-TON CAPACITY

Amer.-Arge. K-10	1,000	1,575	86	Exide-Hy.....	137½	50	Bevel.....	French hood
Amer.-Arge. L-10	1,000	1,650	86	Exide-Hy.....	137½	50	Bevel.....	French hood
Atlantic. 10B&10C	1,000	1,940*	102	Exide-Hy*	.....	.....	Bevel.....	Platform type
Baker.....	1,000	1,900	86	Opt.....	112*	45*	Dbl chn.	Platform type
Beardsley...10B	1,000	1,900	100	Gould-GC.....	168	55	Top wm.	Elev. bat. box
C.T.....	1,000	1,640	90*	Opt.....	.....	.....	Int-g.....	Two motors
Dunlap.....	1,000	1,250-c	84	Phi. WTX-17	204	60	Dbl chn.	Price
GMC.....1B	1,000	1,900-b	106	Edison, A4*..	150*	45*	Dbl chn.	Bat. above frame
G.V.....	1,000	1,700	88½	Own.....	135	45	Dbl chn.	Platform type
G.V.....	1,000	1,950	108	Own.....	135	45	Top wm.	Worm drive
Walker.....G	1,000	.....	121	Edison*.....	.....	.....	Int-g.....	Motor in axle
Walker.....M	1,000	.....	82*	Edison*.....	.....	40*	Int-g.....	Motor in axle
Ward.....EO	1,000	1,250	90	Opt.....	130	45	Dbl chn.	Platform type
Waverley.....	1,000	1,800	90	Opt.....	135*	50*	Herring.	Herringb. drive

TRUCKS OF ¾-TON CAPACITY

Urban.....15A	1,500	1,500	86	Exide-Hy.....	165	40	Dbl chn.	Platform type
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TRUCKS OF 1-TON CAPACITY

Amer.-Arge. K-20	2,000	1,720	96	Exide-Hy.....	165	45	Bevel.....	French hood
Amer.-Arge. L-20	2,000	1,795	96	Exide-Hy.....	165	45	Bevel.....	French hood
Atlantic.....1C	2,000	2,200*	103	Exide-Hy*	.....	.....	Dbl chn.	Platform type
Baker.....O	2,000	2,300	102	Opt.....	140*	40*	Dbl chn.	Platform type
Beardsley...20B	2,000	2,350	108	Gould-ID.....	193*	45*	Top wm.	Elev. bat. box
Buffalo.....CCA	2,000	2,400	102	Opt.....	178½	45*	Spur.....	Platform type

TRUCKS OF 1-TON CAPACITY—Continued

C.T.....1	2,000	2,095	110	Opt.....	.....	.....	Int-g.....	Two motors
GMC.....2B	2,000	1,300-b	118	Edison, A5*..	187½	42*	Dbl chn.	Bat. above frame
G.V.....	2,000	2,100	103	Own.....	162	45	Dbl chn.	Platform type
Old Hickory...20W	2,000	1,900	110	Gould.....	220	40	Top wm.	Worm drive
Walker.....K	2,000	.....	94*	Edison*.....	.....	40*	Int-g.....	Motor in axle
Ward.....EA	2,000	1,500	99	Opt.....	150	40	Dbl chn.	Platform type
Waverley.....	2,000	2,150	104	Opt.....	189*	45*	Dbl chn.	Platform type

TRUCKS OF 1½-TON CAPACITY.

GMC.....3B	3,000	1,450-b	130	Edison, A6*..	225*	40*	Dbl chn.	Bat. above frame
Urban.....30A	3,000	1,900	102	Exide-Hy.....	165	35	Dbl chn.	Platform type

TRUCKS OF 2-TON CAPACITY

Atlantic.....2C	4,000	2,750*	115½	Exide-Hy*.....	.....	.....	Dbl chn.	Platform type
Baker.....U	4,000	2,800	120	Opt.....	168*	40*	Dbl chn.	Platform type
C.T.....2	4,000	2,725	116	Opt.....	.....	.....	Int-g.....	Two motors
Detroit.....	4,000	.....	128	Edison, A8...	300	50	Dbl chn.	Platform type
GMC.....4B	4,000	1,650-b	138	Edison, A6*..	225*	32*	Dbl chn.	Bat. above frame
G.V.....	4,000	2,600	111½	Own.....	216	45	Dbl chn.	Platform type
Walker.....L	4,000	.....	107*	Edison*.....	.....	40*	Int-g.....	Motor in axle
Ward.....EB	4,000	1,900	114	Opt.....	200	35	Dbl chn.	Platform type
Waverley.....	4,000	3,000	114	Opt.....	216*	35*	Dbl chn.	Platform type

TRUCKS OF 2½-TON CAPACITY

Urban.....50A	5,000	2,500	118	Exide-Hy.....	192	35	Dbl chn.	Platform type
Walker.....D	5,000	.....	127*	Edison*.....	.....	40*	Int-g.....	Motor in axle

ABBREVIATIONS: General, *, other options; Opt, optional. Price, -c, complete with body and battery; -b, without battery. Load Capacity, -t, tractor, carries none or only a part of load. Battery Make and Type, Exide-Hy, Exide Hycap; Phil, Philadelphia. Drive, Final Reduction, Dbl chn, double chain; Top wm, worm gear with worm on top; Spur, spur gears; Int-g, internal gear; Sing chn, single chain; Herring, herringbone gear; Vrt worm, worm gear with worm vertical; S-bevel, spiral bevel.

Explanation of the Terms Used in Tables

The Meanings of the Headings Under Which the Different Methods of Construction Are Listed

SPECIFICATIONS of eighty-four electric chassis, produced by twenty-two different manufacturers, are given here with. These specifications are grouped similarly to the gasoline vehicle specifications published in Motor World January 13 and are to be read similarly. The different makes are grouped, a single line across the table being devoted to each model. The vertical columns give the features of design of all models for purposes of comparison.

Necessarily, there being so much information to confine in a given space, abbreviations are used in the table. These abbreviations are explained in the foot-notes at the bottom of the table. The meanings of the terms are given in the following glossary:

Load Capacity—The load capacity of a motor truck is the maximum amount of load it is intended to carry, in addition to the weight of the body, the cab and the crew.

Price of Chassis—The chassis price is the list

price of the chassis, equipped with a standard seat or cab and all other standard equipment except the body, which is charged for extra. Some makers, however, do not sell chassis not equipped with bodies, as indicated in the table by a small c following the price, indicating that the price is for the complete vehicle. Other makers list their chassis without battery. This is indicated by b, meaning minus the battery.

Motor Winding—Two types of winding are employed, series and shunt. Series winding is that in which all of the current is obliged to pass first through the armature and then through the field, the same size wire being used in both of the windings.

In shunt winding all the current flows through the armature, but only a portion enters the fields, this portion being shunted across the armature circuit through fine wires, the resistance limiting the amount of current that can flow through the field. To secure the same amount of magnetism

in the latter type, a great number of turns of the fine wire are taken.

Motor Horsepower—Electrical horsepower is not fixed as in gasoline engines, but is capable of great increase for brief moments. A horse may exert hundreds of horsepower for one supreme effort, but in the course of a day he will produce only a certain number of horsepower-hours. So the electric motor may for a brief period exert many times its normal torque in foot-pounds per minute.

Battery, Number of Plates—In a lead battery the plates are of two sorts of lead, one soft, spongy pure lead, and the other peroxide of lead. The Edison battery does not use lead plates, but steel and nickel-hydrate plates. The amperage of a battery depends upon the plate surface it has, so that the greater the number of plates per cell, the more powerful the battery.

Battery, Number of Cells—A storage battery consists of a number of cells, as described above.

Classified According to Their Catalog Capacities

TRUCKS OF 3-TON CAPACITY

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheelbase	Battery Make	Ampere-Hour Capacity	Mileage per Charge With Load	Final Drive	Feature
GMC.....6B	6,000	1,900-b	150	Edison, AS*	300*	30*	Dbl chn.	Bat.aboveframe

TRUCKS OF 3½-TON CAPACITY

Atlantic.....3C	7,000	3,375*	134	Exide-Hy*	.....	.....	Dbl chn.	Platform type
Baker.....CC	7,000	3,500	137	Opt.....	224*	40*	Dbl chn.	Platform type
Couple-Gear.....H	7,000	4,250	90	U.S.L., WBT	300	35	Bevel4..	4-wheel drive
Couple-Gear.....HF	7,000	3,750	120	U.S.L., WBT	325	35	BevelF..	Front-whl drive
C.T.....3j	7,000	3,530	115	Opt.....	.....	.....	Int-g4..	4-wheel drive
G.V.....	7,000	3,250	128½	Own.....	270	40	Dbl chn.	Platform type
Walker.....E	7,000	.....	140*	Edison*	.....	40*	Int-g..	Motor in axle
Ward.....EC	7,000	2,450	144	Opt.....	275	30	Dbl chn.	Platform type
Waverley.....	7,000	3,400	127	Opt.....	270*	35*	Dbl chn.	Platform type

TRUCKS OF 4-TON CAPACITY

GMC.....8B	8,000	2,100-b	156	Edison, AS*	300*	27*	Dbl chn.	Bat.aboveframe
Urban.....80A	8,000	3,000	130	Exide-Hy....	275	35	Dbl chn.	Platform type

TRUCKS OF 5-TON CAPACITY

Atlantic.....5C	10,000	3,825*	144	Exide-Hy*	.....	.....	Dbl chn.	Platform type
Baker.....EA	10,000	3,850	137	Opt.....	252*	40*	Dbl chn.	Platform type
Couple-Gear.....A	10,000	4,800	90	U.S.L., WBT	350	35	Bevel4..	4-wheel drive
C.T.....5	10,000	3,935	132	Opt.....	.....	.....	Int-g4..	4-wheel drive
GMC.....10B	10,000	2,350-b	166	Edison, A10*	375*	27*	Dbl chn.	Bat.aboveframe
G.V.....	10,000	3,700	139	Own.....	324	35	Dbl chn.	Platform type
Ward.....	10,000	2,950	174	.....	350	25	Dbl chn.	Platform type
Waverley.....	10,000	3,950	136	Opt.....	324*	30*	Dbl chn.	Platform type

TRUCKS OF 6-TON CAPACITY

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheelbase	Battery Make	Ampere-Hour Capacity	Mileage per Charge With Load	Final Drive	Feature
Couple-Gear...AF	12,000	.....	120	U.S.L., WBT	375	35	BevelF..	Front-whl drive
GMC.....12B	12,000	2,500-b	174	Edison, A10*	375*	24*	Dbl chn.	Bat.aboveframe

CAPACITIES NOT GIVEN

Couple-Gear, 3-whl	.....	2,650	.....	U.S.L., WBT	175	30	Bevel...	3-wheeler
Field Bus, 18-pass	.....	6,500-c	.....	Edison, A6..	225	100	Top wm.	Mileage per ch.
Field Bus, 38-pass	.....	10,500-c	194	Edison, A10..	375	125	Int-g...	Mileage per ch.

ELECTRIC INDUSTRIAL TRUCKS

Automatic.....D	2,000	.....	37½	Edison, A4*	150*	30*	Dbl chn.	Opt. bat. loca.
Electromobile...A	3,000	1,400	55	Exide.....	126	.....	Dbl chn.	Aut.brake lock
Electromobile...C	3,000	1,250	50	Exide.....	100	.....	Dbl chn.	Aut. brake lock
Electromobile...E	3,000	1,100	43	Exide.....	100	.....	Dbl chn.	Aut. brake lock
Automatic.....E	4,000	.....	52	Edison, A4*	150*	32*	Dbl chn.	Opt. bat. loca.
Automatic.....M	4,000	.....	72*	Edison, A6*	225*	22½*	Top wm.	Low platform
Cowan Transveyor	4,000	1,650*	.....	Opt.....	7*	4*	Vrt wm.	Self-loader
Elwell-Parker...	4,000	.....	85	Edison, A6*	225*	.....	Int-gF..	Large wheels
Elwell-Parker...	4,000	.....	114	Edison, A6*	225*	.....	Int-gF..	Large wheels
Elwell-Parker...	4,000	.....	53	Edison, A6*	225*	.....	Int-gF..	Front-whl drive
Elwell-Parker...	4,000	.....	78	Edison, A6*	225*	.....	Int-gF..	Front-whl drive
Elwell-Parker...IB	4,000	.....	52	Edison, B6*	120*	.....	Top wm.	Worm drive
Elwell-Parker...IB	4,000	.....	55	Edison, B6*	120*	.....	Top wm.	Worm drive
Elwell-Parker...ID	4,000	.....	68	Edison, B6*	120*	.....	Top wm.	Worm drive
G.V.....	2,000	1,250-c	42½	Own.....	48	25	Spur....	Two motors
Hoag-Thayer...A	4,000	1,500	78	Edison, A6..	225	20	Spur....	4-wheel steer
Hoag-Thayer...B	4,000	1,950	84	Edison, A5..	187½	20	Spur....	4-wheel steer
Hoag-Thayer...D	4,000	2,025	109	Edison, A5..	187½	20	Spur....	4-wheel steer
Hunt.....	4,000	.....	60	Exide.....	140*	25*	Int-g...	Int-gear drive
Hoag-Thayer.MT	10,000	2,900	36	Edison, A6..	225	25	Spur....	Tractor
Mercury..Pullem	.....	.....	38	Opt.....	.....	.....	Bevel...	Tractor

ABBREVIATIONS: General, *, other options; Opt, optional. Price, -c, complete with body and battery; -b, without battery. Load Capacity, -t, tractor, carries none or only a part of load. Battery Make and Type, Exide-Hy, Exide Hycap; Phil, Philadelphia. Drive, Final Reduction, Dbl chn, double chain; Top wm, worm gear with worm on top; Spur, spur gears; Int-g, internal gear; Sing chn, single chain; Herring, herringbone gear; Vrt worm, worm gear with worm vertical; S-bevel, spiral bevel.

Each cell has a voltage of approximately 2, so that to secure a voltage high enough for the rest of the vehicle, it is not possible to use one large cell with sufficient and large enough plates to give the required amperage, but it is necessary to have a number of cells, for each cell added to the battery increases the voltage by 2. The different cells of a battery are wired together and are connected with the controller as though they were one.

Battery, Number of Trays.—The different cells of a battery are grouped in trays, which may be picked up and handled independently of the rest.

Battery Location.—There are two principal methods of carrying the battery; the first is that in which the battery is carried under the floor, beneath the frame, so that the space above the frame is clear so that any type of body may be fitted. A vehicle so made is said to be of the platform type, or to carry its battery amidships, underslung. The other standard battery location

is above the frame and partially under the seat, or amidships, over the frame. Other battery locations are at the rear, above the frame; at the rear, below the frame; at the front, above the frame; at the front, below the frame; under a hood; under the seats, and, when divided into two sections, under the hood and amidships, and under the hood and under the seat.

Mileage Per Charge.—The manufacturer's figures are given in this instance, as there is no means of accurately determining this from the amperage-hour capacity or other information given.

Amperage-Hour Capacity.—Amperage-hour capacity is the measure of the current in a battery. It represents the amperes of charge that may be held by the battery multiplied by the number of hours, at normal discharge rates, it will require to discharge the battery to the minimum safe limit. Thus, if a battery have a charge of 40 amperes, and discharges in 5 hours, it is said to have 200

ampere-hours capacity. It will give an average of 40 amperes for 5 hours, 20 amperes for 10 hours, 80 amperes for 2 hours 30 minutes, or any similar combination of the two factors.

Controller Lever Location.—The controller lever occupies a variety of locations, namely, to the left; to the right; in the center; on the seat to the left; on the steering column below the wheel; and on top of the wheel.

Speeds.—The speeds forward in an electric are the controller notches, and are obtained by increasing resistance so as to restrict the current flow for slow speeds. In some vehicles, resistances are not used to effect different speeds, but different grouping of the battery is used, the whole battery giving the highest speed, two-thirds of it intermediate, and one-third low, for example.

Drive, First Reduction.—As a smaller, lighter motor can be used if it is operated at high speeds to give the same power, high-speed motors have

become the rule in electric vehicle practice. The use of these motors requires a considerable reduction on the final drive to the road wheels, however, especially on the heavier models, and for this reason the drive is usually divided into two parts with a primary and secondary reduction.

The first reduction is by herringbone gears, a form of cylindrical gear in which the teeth are V-shaped and possess the advantage of quietness and of having more than one tooth in mesh at a time; by bevel gears, direct to the jackshaft, as on a chain-driven gasoline vehicle; by roller or silent chain, or by direct spur gearing. The word direct, appearing in this column of the specification table, means that there is no primary reduction; the final reduction is the only one.

Drive, Second Reduction.—The forms of gearing used in the first reduction are also used in the second reduction with worm gearing, double chains, internal gears and spiral bevels in addition.

Comparative Data on 26 Different Makes of Electric Trucks

Comparative Specifications of 84 Electric Commercial Vehicles for 1915 Arranged for Convenient Comparison

Name and Model	Load Capacity in Pounds	Price of Chassis	Wheel-base	TIRES		MOTOR				BATTERY						CONTROL			DRIVE		SPRINGS	
				Front	Rear	Location	Make	Winding	Horse-power	Make, Type and Number Plates	Number Cells	Amperage-Hour Capacity	Number Trays	Location	Mileage per Charge With Load	Steer	Control-ler	Speeds Forward	First Reduction	Final Reduction	Front	Rear
American-Argo K-10	1,000	1,575	86	35x3	35x3	Unit-x	West.	Series	3 1/2	Exide-Hy. 11	40	137 1/2	4	Amid-u	50	Wheel-l	Wheel-t	4	Herring	Bevel	—Eil	—Eil
American-Argo L-10	1,000	1,650	86	35x3	35x3	Unit-x	West.	Series	3 1/2	Exide-Hy. 11	40	137 1/2	4	Amid-u	50	Wheel-l	Wheel-t	4	Herring	Bevel	—Eil	—Eil
American-Argo K-20	2,000	1,720	96	35x3 1/2	35x3 1/2	Unit-x	West.	Series	3 1/2	Exide-Hy. 13	40	165	5	Amid-u	45	Wheel-l	Wheel-t	4	Herring	Bevel	—Eil	—Eil
American-Argo L-20	2,000	1,795	96	35x3 1/2	35x3 1/2	Unit-x	West.	Series	3 1/2	Exide-Hy. 11	40	165	5	Amid-u	45	Wheel-l	Wheel-t	4	Herring	Bevel	—Eil	—Eil
Atlantic 10B&10C	1,000	1,980*	102	34x3*	36x3*	Unit-x	G. E.*	Series	3	Exide-Hy.*	44*	112*	6*	Opt.	40*	Wheel	Wheel-u	4	Direct	Bevel	—Eil	—Eil
Atlantic 1C	2,000	2,200*	103	34x3 1/2	36x4	Unit-x	G. E.	Series	3	Exide-Hy.*	44*	140*	6*	Amid-u	40*	Wheel	Wheel-u	4	Chain	Direct	—Eil	—Eil
Atlantic 2C	4,000	2,750*	115 1/2	36x4	36x3 1/2	Unit-x	G. E.	Series	4	Exide-Hy.*	44*	168*	6*	Amid-u	40*	Wheel	Wheel-u	4	Chain	Direct	—Eil	—Eil
Atlantic 3C	7,000	3,375*	134	36x5	40x4 1/2	Unit-x	G. E.	Series	7	Exide-Hy.*	44*	224*	6*	Amid-u	40*	Wheel	Wheel-u	4	Chain	Direct	—Eil	—Eil
Atlantic 5C	10,000	3,825*	144	36x6	40x5 1/2	Unit-x	G. E.	Series	10	Exide-Hy.*	44*	252*	6*	Amid-u	40*	Wheel	Wheel-u	4	Chain	Direct	—Eil	—Eil
Automatic D	2,000	37 1/2	37 1/2	16x3	16x3 1/2	Amid	Own.	Series	1 1/2	Edison, A4*	20*	150*	2*	Rear-o*	30*	Lever-r.	Left	3	Direct	Direct	Coil	Coil
Automatic E	4,000	52	52	16x3 1/2	17x3 1/2	Amid	Own.	Series	2	Edison, A4*	21*	130*	3*	Rear-o*	32*	Lever-r.	Left	3	Direct	Direct	Coil	Coil
Automatic M	4,000	72*	72*	16x3 1/2	17x3 1/2	Unit-x	Own.	Series	1 1/2	Edison, A6*	21*	225*	3*	Front-u	22 1/2*	Lever-r.	Left	3	Direct	Top worm	None	None
Baker X	1,000	1,900	86	36x3	36x3 1/2	Unit-l	G. E.	Series	3	Opt.	42*	112*	6*	Amid-u	45*	Wheel-l	Wheel-u	5	Chain	Direct	—Eil	—Eil
Baker O	2,000	2,300	102	36x3 1/2	36x4	Unit-l	G. E.	Series	4	Opt.	42*	140*	6*	Amid-u	40*	Wheel-l	Wheel-u	5	Chain	Direct	—Eil	—Eil
Baker U	4,000	2,800	120	36x4	36x3 1/2	Unit-l	G. E.	Series	5	Opt.	42*	168*	6*	Amid-u	40*	Wheel-l	Wheel-u	5	Chain	Direct	—Eil	—Eil
Baker CC	7,000	3,500	137	36x6	38x4 1/2	Unit-l	G. E.	Series	7	Opt.	42*	224*	6*	Amid-u	40*	Wheel-l	Wheel-u	5	Chain	Direct	—Eil	—Eil
Baker EA	10,000	3,850	137	36x7	38x5 1/2	Unit-l	G. E.	Series	10	Opt.	42*	252*	6*	Amid-u	40*	Wheel-l	Wheel-u	5	Chain	Direct	—Eil	—Eil
Beardley 10B	1,000	1,900	100	34x4	34x4 1/2	Amid-o	West.	Series	2 1/2	Gould-GC. 13	40	168	8	Amid-u	55	Wheel-l	Seal-l	4	Direct	Top worm	—Eil	—Eil
Beardley 20B	2,000	2,350	108	34x4 1/2	34x5	Amid-o	West.	Series	3	Gould-ID. 15	40*	193*	10*	Amid-u	45*	Wheel-l	Seal-l	4	Direct	Top worm	—Eil	—Eil
Beardley CCA	2,000	2,400	102	36x3 1/2	36x5	Amid	G. E.	Series	2 1/2	Opt., 15	44*	178 1/2*	10*	Amid-u	45*	Wheel-l	Seal-l	5	Bevel	Spur	—Eil	—Eil
Couple Gear 3-wheel	7,000	2,650	90	36x4 1/2	36x4 1/2	F-wheel	Own.	Series	5	U.S.L., WBT-15	40	175	4	Amid-u	30	Wheel-r	Seal-l	5	Direct	Bevel	Coil	Coil
Couple-Gear H	7,000	4,250	120	36x4 1/2	36x4 1/2	In whl-l	Own.	Series	3	U.S.L., WBT-25	44	300	8	Amid-u	35	Wheel-r	Seal-l	5	Direct	Bevel	—Eil	—Eil
Couple-Gear HF	7,000	3,750	120	36x4 1/2	36x4 1/2	In whl-l	Own.	Series	5	U.S.L., WBT-27	40	325	4	Amid-u	35	Wheel-r	Seal-l	5	Direct	Bevel	—Eil	—Eil
Couple-Gear A	10,000	4,800	90	36x5 1/2	36x5 1/2	In whl-l	Own.	Series	3	U.S.L., WBT-29	44	335	8	Amid-u	35	Wheel-r	Seal-l	5	Direct	Bevel	—Eil	—Eil
Couple-Gear AF	12,000	4,800	120	36x5 1/2	36x5 1/2	In whl-l	Own.	Series	5	U.S.L., WBT-31	40	375	6	Amid-u	35	Wheel-r	Seal-l	5	Direct	Bevel	—Eil	—Eil
Cowan Transveyor	4,000	1,650*	120	36x5 1/2	36x5 1/2	Front-o	Wagner	Series	2	Opt.	15*	7*	6	Front-o	4*	Wheel-l	Right	3	Direct	Vrt worm	None	None

[illegible]

ABBREVIATIONS: General, * other options. Opt, optional. Price, -, complete with body and battery. -, without battery. Load Capacity, -t, tractor, carries none or only a part of load. Tires, d, dual. s, steel. Mater Location, Unit-x, unit with axle. Unit-i, unit with jack-shaft. Amid, amidships. F-wheel, front wheel. Rear, rear wheel. Horsepower, is for single motors, where two or more motors are used, it represents the power of each. Battery Make, Type and Number of Plates, Excite-Hy, Exide Hicap. Phil, Philadelpia. Battery Location, Amid-u, amidships over frame and under hood. Amid-l, amidships over frame and under hood. Rear-o, to the rear, over frame. Rear-u, to the rear, under frame. Front-o, at the front, over frame. Front-u, at the front, under frame. H-ks, under hood and under seats. U-seat, under seat. Steer, Wheel-t, wheel on the right side. Wheel-l, wheel on the left side. Lever-i, lever on the right side. Lever-u, lever on the left side. Wheel-o, on top of steering wheel. Wheel-u, on top of steering wheel. Seat-i, to the right of seat. Seat-l, to the left of seat. Drive, First Reduction, Wheel-o, wheel on the right side. Wheel-l, wheel on the left side. Direct, only one reduction. Spur gear gear. Drive, Final Reduction, Dbt oha, double chain. Top worm, worm gear with worm on top. Spur, spur gear. Sing oha, single chain. herringbone gear. Vrt worm, worm gear with worm vertical. S-bevel, spiral bevel. Spring, i-ell, self-aligning. Elio, elastic. i-ell, three-spring-splastic. Plast, dadiom. Self-aligning.

Advanced Maintenance

STEERING WHEEL ANGLES

By George Fernwell

(Continued from last week.)

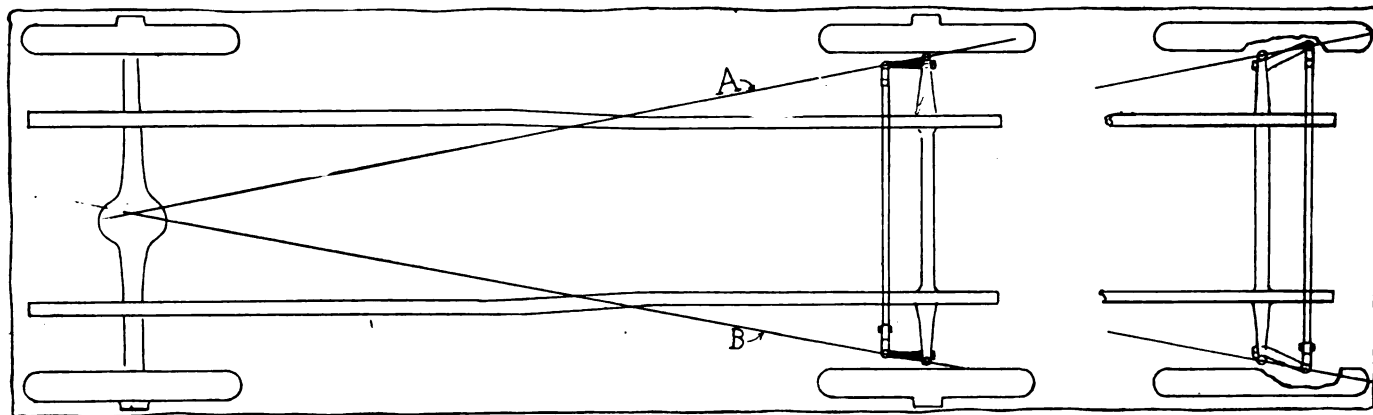


Fig. 1—This shows the theoretically correct angle which the steering arms should form with the knuckle shafts or front axle ends, the lines A and B intersecting the king pin and the steering knuckle pivot and meeting at the center of the rear axle

The angle which the steering arms should form with their adjacent knuckle shafts or front axle ends conforms in theory with the direction of the lines A and B, Fig. 1.

As may be seen, lines A and B intersect (1) the axis of the respective king pins or steering knuckle pivots, (2) the axis of the pivot pin at the extremity of the steering arm, and (3) meet at the center of the rear axle.

Obviously, with the lines A and B intersecting the respective points indicated above, the angle formed by them with the axis of the front axle would vary according to the varying length of wheelbase of different chassis.

At first glance this seems a simple alignment test to apply to determine the normal angle which a deformed and re-straightened steering arm should form with the axis of its adjacent knuckle shaft or front axle end.

Laying Out the Normal Angles

It should not, however, be difficult to lay out on the floor, bench, or drawing board, a few necessary dimensions in order to obtain the required normal angle of the steering arm with the axis of the adjacent front axle ends. It is not necessary to make the layout to full dimensions; a scale of 6 inches or 3 inches to the foot may be considered

just as accurate for all practical requirements. While the layout is drawn so as to show both line A and line B, it is only necessary to draw half, showing either, thus saving time and space required for the layout.

Having drawn a straight center or base line, C, Fig. 1, the line D representing the axis of the rear axle may be drawn in full or indicated by a short line or dot.

Next, the wheelbase or distance from center to center of front and rear axles should be measured and marked off at the center line C from the position of the rear axle D to the point E. On this latter point lines should be drawn at

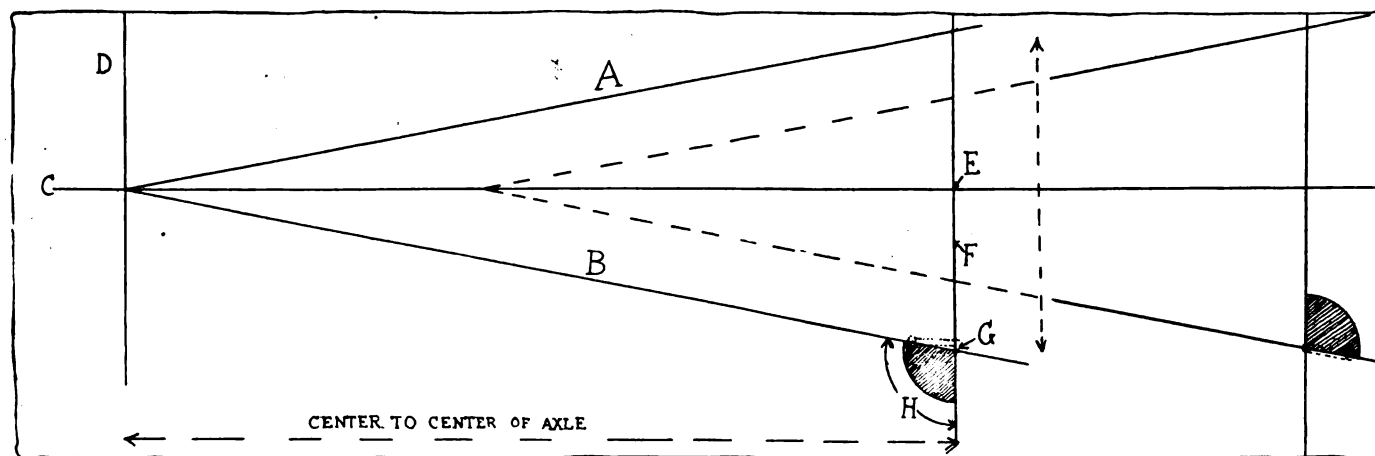


Fig. 2—This shows how a lay-out may be made on the floor or on a bench to give the theoretically correct angles illustrated in Fig. 1. The center line C is drawn first, after which the lines A and B may be drawn in when the dimensions F and the distance from center to center of the axles have been ascertained

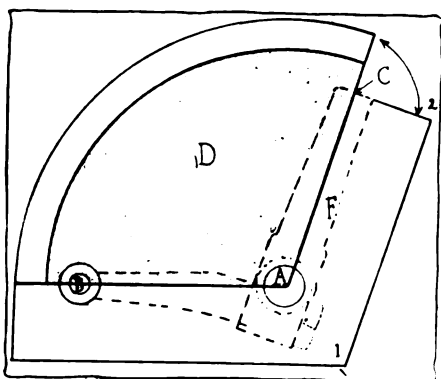


Fig. 3—From the original template D, two other templates may be made with which to gauge the accuracy of the steering arms after they have been straightened

right angles to the center line representing the axis of the front axle ends, making the line F of a length to roughly correspond with the distance outside of the two front wheels.

Next, on the line F locate the position of the axis of the king pins or steering knuckle pivots as at G.

Next, draw a line from the axis of one or both king pins to the point where the rear axle line D intersects the center line C.

A cardboard, or preferably sheet-metal template, may then be made of the angle H indicated at Fig. 2.

In some makes of chassis the steering arms instead of pointing rearward of the front axle as indicated in Fig. 1, point forward of the front axle, as indicated in the same figure.

Applying Templates to the Work

Having obtained the template of the required angle there will be no further use for the layout. The first thing to be noted upon applying the template to the axle work will be that, the knuckle shaft and the steering arm lying in such widely separated horizontal planes when the knuckle is assembled, the simple template cannot be effectively used to obtain more than a rough alignment.

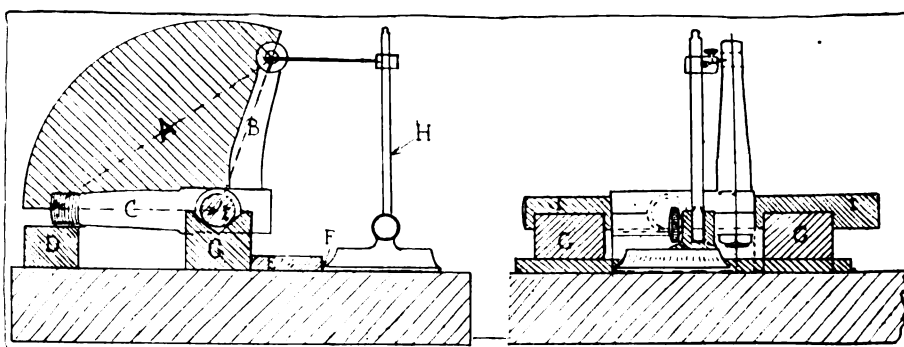


Fig. 5—Method of making alignment test using a machinist's surface gauge. D is a solid bar; G, a machinist's V-block; I, the king pin or a substitute; A, the template; H, the surface gauge which is held against the bar E at the point F

From the original template mark the outline of the required angle on two pieces of sheet metal 2 or 3 inches larger all around than the original template. Lay one, for subsequent drilling, holes in the sheet metal to correspond in position and diameter with the bore of the knuckle A. See Fig. 3.

Next, mark for drilling in each piece of sheet metal a hole corresponding in position and diameter to the bore of the pivot hole in the outer end of the steering arm B. Having carefully drilled the holes indicated and laid out the line 1-2 about $1\frac{1}{2}$ inch from and parallel with A-C, the sheet metal should be cut to it very accurately.

Obtaining Working Dimensions

Fig. 4 illustrates the method of using the pair of fitted templates.

By inserting the king pin or a round steel bar as a substitute in and through the bore of the knuckle and through holes in the pair of templates, and another round steel bar of suitable length and diameter through the bore in the extremity of the steering arm and through the corresponding holes in the templates, placing the knuckle and their templates thus assembled on a surface plate, a steel straight edge may be applied to the square notch C, Fig. 4, cut

at one corner of each template.

With the straight edge held as indicated in Fig. 4, the most convenient means is afforded of quickly determining the extent to which the lathe center mark in the extreme outer end of the shaft may vary from its correct position.

Using Surface Gauge and Plate

Fig. 5 illustrates another method of making effective use of the original template described at the beginning of this discussion by using the conventional machinist's surface gauge, surface plate, a pair of V blocks and a steer arbor shaft of the same diameter as the king pin.

The template is not meant to be held in the position in Fig. 5. It is drawn in that position to show the relation between the various required dimensions of template and knuckle.

With a deformed steering arm roughly straight ready for setting to the correct angle, the radius of the steering arm may be marked off upon one edge of the template and the extreme radius of the shaft along the adjacent straight edge of the template. The length of the hypotenuse connecting the two indicated radii will furnish the working dimension from the center of the center mark in the extreme end of the shaft to the center of bore in the outer end of the steering arm.

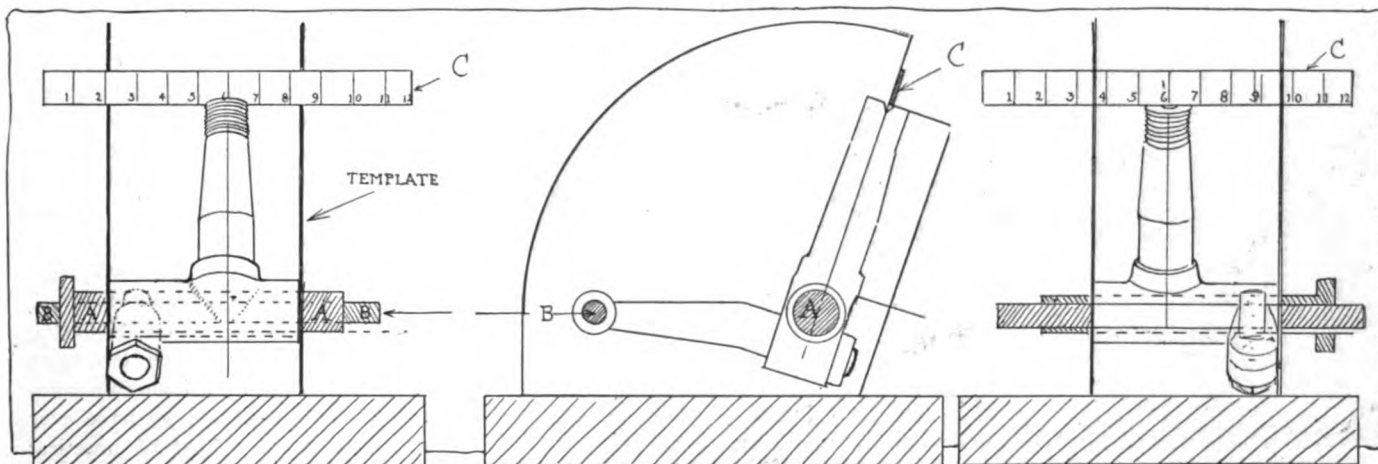


Fig. 4—This shows three methods of using a pair of fitted templates for gauging the accuracy of the steering arms. Either the king pin or a substitute may be used as shown and a straightedge laid across the edges of the two templates. This shows how much the lathe center mark may be "out"

WIDE-AWAKE MERCHANDISING



This is a suggestion of the Goodyear Tire & Rubber Co. to its dealers and branches. It is designed by the company's Window Display Department and is one of a series which is being put out regularly. It is simple, striking and appropriate.

AWAKENING IN TIRE WINDOWS

Many Excellent Displays Show Up-To-Date Spirit

Certainly the merchandising spirit is abroad in the tire business and is constantly revealing itself in thousands of ways, but in none more clearly and definitely than in the elaborate window displays now being made in various parts of the country.

Some of these displays are mighty good, because they carry out and exploit a definite idea. Others are not so good, but on the whole there has been a marked advance that augurs well for the future.

The value of window displays has been recognized and, to the writer, who well remembers the days, not so very far past, when the most exciting thing the average tire dealer could think of was to arrange two or three tires in some new geometrical form, the change in ideas has been sweeping and radical.

The "Motorist's Christmas" shown at the Detroit branch of the B. F. Goodrich Co., embraced not only the tree with its many colored electric lights, but also painted scenery for a background—a fake mantel, where the stockings—real ones—were hung, and some beautiful holly wreaths and other Christmas ornaments. The merchandising value of this display requires no comment.

At night the tree was brilliantly lighted with colored bulbs, and the reader can well imagine that the scene was one that appealed to the imagination of every small boy and girl—and some not so small—who passed that way.

"It is the best thing we have ever done in the way of a window display," remarked Mr. Young, of the Goodrich company. "It not only attracted more attention and drew more favorable comments than anything else we have ever done, but it made a host of practical suggestions from which we are quite sure our dealers benefited."



The Goodrich window showed a room with real stockings at a fireplace. There were plenty of suggestions of gifts and the display won attention.

KELLY TRIMS TIRE BRANCH

Makes Detroit Salesroom Into Place of Beauty

The Kelly-Springfield Tire Co.'s Detroit branch store had one of the most beautiful and strikingly effective holiday displays even seen in the West. It was lavish both in the quality and quantity of the materials used, and it was treated with a skill that shows true artistic merit combined with window dressing ability of an exceptionally high order.

The store is handsome and big, with high ceilings. It required decorations that were at once rich, simple and generous in effect. Whoever trimmed the windows grasped the situation instinctively and nowhere was there a discordant note. The Christmas trees in each corner are big and full. The wreaths are extra large, and the ground pine was the thick, bunched kind that costs money.

These photographs were taken at night. They are wonderfully good. They show the details in fine style. But even these pictures fail to convey fully the true beauty of the windows. Try to imagine, if you can, the extraordinary effectiveness of the big mass of greens, the frosted red lights, the snowy floor with its mica-covered, crystal-like appearance, and the clean-looking tires, and then get the warm, glowing effect of the unique interior lighting system, and then you will have a faint idea of the really beautiful effect produced.

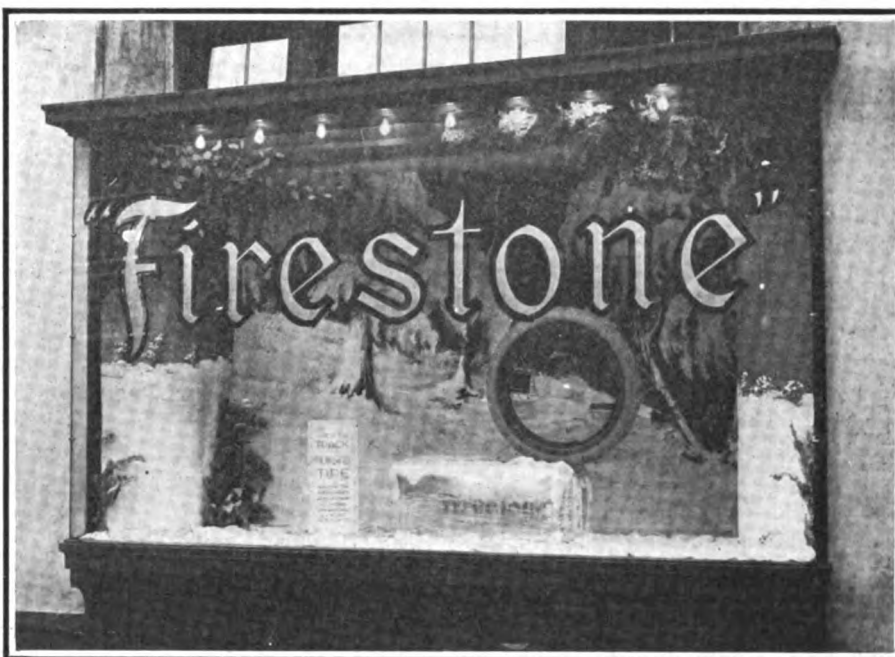
One of the photographs gives some idea of the decorations viewed from the inside. The picture speaks for itself. The wood trim of this store is a rich mahogany. Note the lights on the posts. The little square you observe cut off from the main floor is intended as a resting place for customers.

FIRESTONE WINTER SCENE SCORES HIT

This window at the right has a canvas drop back painted at the factory. There is snow and winter all about. The cake of ice is of glass panes painted with a paste of epsom salts and stale beer. The Firestone name is on the rear pane with lights behind. The tread has left its track in asbestos paste across the top of the cage. The window appeared in New York show week and was one of the row's attractions.



Top—Interior of Kelly-Springfield tire branch. Bottom—A view from the outside



The Firestone window is a design sent out by the factory Window Department—Mr. Bowling, designer

QUESTIONS ANSWERED

S. A. E. Horsepower Formula Explained Editor Motor World:

Kindly advise me the manner of ascertaining the S. A. E. rating of automobile engines.

East Liverpool, Ohio.

J. R. D.

The Society of Automobile Engineers' formula for indicating the horsepower of an automobile engine represents the result of the experience of automobile engineers and was first used by the old Association of Licensed Automobile Manufacturers. The formula is as follows:

$$D^3 N$$

$$2.5$$

in which D represents the diameter of the cylinder in inches and N is the number of cylinders. The divisor is a constant which has been found by experience and practice to give as close an approximation of power as is practical and desirable.

Simple Carbon Removers

Editor of Motor World:

I have had a number of recommendations as to the best solution to use in cylinders for the purpose of burning out carbon, especially in the Overland, Model 80 T. Will you give me several solutions to use and the method of using them?

West Somerville, Mass.

J. H. H.

There are a number of prepared solutions that you can use for this purpose and almost any of them will give you the results for which you are seeking. As a rule, these solutions sell for approximately \$1 per quart.

Undoubtedly the simplest possible solution to use for the purpose is rain-water; if properly used it will not harm the motor, and it will materially assist in removing the carbon deposit. The method of using water is to feed it slowly through the auxiliary air inlet of the carbureter with the motor running about 1,000 r. p. m. It should not be fed so rapidly that the motor chokes up badly. The quantity should be gauged so that the motor slows down only slightly.

You should feed approximately one quart, and, after it has all been fed in, permit the motor to run on about half throttle for three or four minutes. Following the application of the water you should make certain that the cylinders and pistons are well lubricated.

Considerable success has been attained with the use of alcohol for removing carbon. Four ounces is used for each cylinder and is inserted through the petcocks and allowed to remain with the motor idle for one-half to two hours. This will soften the carbon, after which the motor should be started up and run five or ten minutes on about one-quarter throttle.

Alcohol has the advantage that it is perfectly harmless. After it has remained in the cylinders for ten or fifteen minutes, the motor should be cranked slowly by hand about one-half revolution to distribute the alcohol thoroughly through the combustion space.

Editor Motor World:

I wish you would advise me what the trend was in Europe before the war broke out in regard to the manufacture of six-, eight- and twelve-cylinder motors. Are they increasing or is the tendency to perfect the four-cylinder? Is the gearless transmission or friction drive used to any extent?

Quincy, Ill.

L. I.

Owing to the somewhat heavy horsepower tax which is inflicted upon those who own cars in England, the trend has been all toward the production of small-bore four-cylinder motors which are capable of operating at very high speeds and are therefore much more efficient than larger, heavier motors operating at comparatively slow speeds.

The six-cylinder motor does not appear to have made any increase during the year gone by. There is only one maker of eight-cylinder motors and that is DeDion Bouton, and as far as is known only one maker has produced a twelve-cylinder car, though this was used only for racing purposes and gives no indication of becoming a commercial proposition. This maker was Sunbeam.

The gearless transmission or friction drive is not used to any great extent, though it finds some favor with the makers of small cars. In general, however, these small cars are miniature reproductions of their larger brothers.

Cadillac Cooling Space

Editor Motor World:

Will you tell me the shape of the cylinders in the new eight-cylinder Cadillac engine and explain the method of cleaning the water-jacketing space.

Do these cylinders have copper jackets like the older Cadillacs?

New York

J. H. B.

The cylinders of the new Cadillac are L-head in form, each set of four being cast in a single block and both sets being bolted to a common crankcase at an angle of 90 degrees to each other. The cylinders differ from those in the older Cadillac in that the jackets are cast integral. The jacketing space is closed at the ends by removable plates, as shown, making it a simple matter to clean the jackets should this be necessary, though it is hardly likely.

Book on Aviation

Editor Motor World:

Can you give me the address of a magazine or book giving everything in flying machines or aeroplanes? Would like to have one giving the make-up of the different types.

Omaha, Ill.

H. M.

The Class Journal Co., which publishes Motor World, also publishes a book entitled "The Art of Aviation," by Robert W. A. Brewer, Fellow of the Society of Engineers. The book covers the enormous developments of the past year in every phase of aviation. This makes it the latest authority on the technical details of flying. The author is an engineer and his work has been entirely from the technical side of the question. His book is a practical, working treatise. It presents working drawings for the construction of machines, describes engines and propellers in detail and discusses the art of flying, including gliding experiments, steering, balancing and control. The book contains 279 pages. Price, \$3.50 net, postpaid.

Maker of Engelbert Tire

Editor Motor World:

Please let me know the address of the Engelbert Tire Co.

Elizabeth, Pa.

J. S.

We presume you require the name and address of the American representative for Engelbert tires. This is the Engelbert Tyre Co., 1928 Broadway, New York. The name and address of the manufacturer is Engelbert Tyre Co., Liege, Belgium.

Parts for Michigan 40

Editor Motor World:

Can you give me any information as to who has parts for the Mighty Michigan 40?

West Lynn, Mass.

G. F. H.

Parts for this car can be obtained from the Puritan Machine Co., 51-59 10th street, Detroit, Mich.

Quantity Buying Fallacy as Profit-Maker

Doyno, the Supplyman, Shows Where the Dollar That Turns Over Slowly Is an Inefficient Investment

By Ray W. Sherman

"Say, Ben! Got any more of the Cal-lawassa Automobile Supply Corporation's assets lying around loose?"

Every time Reilly went into Ben Doyno's supply store to buy anything since Ben had made a chance bid and been presented with the stock of a defunct supply dealer, Reilly always asked this question. He always smiled, too, when he said it. That stock was a sore spot with Ben, for much of it had been stock so long that it wasn't even respectable junk.

Reilly Wants to Buy Assets

"I'll hand you a nice soft lump of solder if you ever ask me that again, Con Reilly! See if I don't!"

Ben started feeling around under the papers on his desk for a suitable paper-weight—which should have been on top of the papers.

Reilly simulated an active dodge and ducked his head.

"I mean it this time, Ben. I want some of them. I want a handful of batteries for some bell wiring. I——"

Ben arose from his chair and led the way toward the storeroom. "Come right along and look 'em over. How many barrels will you need? This is our bargain day in dry batteries. Your money back if they work."

Accumulation of Amazing Size

In the storeroom Ben led the way to the spot where the late supplyman's battery stock reposed. They stood and gazed in amazement. Reilly gingerly picked a battery from the top of a barrel of them, blew the dust off and asked, "How much are they?"

"How much? How much?" retorted Doyno. "Better take a couple of bushels of them up to the store and see how many work first. I haven't tried out any of them yet. Maybe they're no good. If you want any they're darned cheap, believe me!"

Reilly drew a newspaper from his pocket and wrapped up a small-sized bundle, and both again gazed in wonderment as they passed out.

"Just look at it!" exclaimed the supplyman.

"Yes, just look!" echoed Reilly.

"That boy Jannett—accent on the nett—was some supplyman. He was some buyer. He wrote fine advertising for his store, as I have remarked before, but that is about as far as his attention to business went!"

"How in the world did he ever accumulate so much stuff?" was the car dealer's earnest request for information.

"One of these quantity buyers, I guess," replied Doyno. "I don't see how he ever could have been loaded up with so much otherwise."

"Quantity is good," replied Reilly.

Wrenches—About a Million

"Look!" said Ben, pointing. "Wrenches—about a million! Jacks—by the thousand! Batteries—by the hoghead! Tonneau chairs—enough to fill a hall! Lap robes—enough for the German army! Good night! Let's get out of here!"

Ben waved his arm in a gesture of dismay and started for the door.

"It gives me the willies every time I go up there," he remarked after he had again regained his chair in the office.

"Do you know, Reilly," he continued, "this quantity buying gag has put a lot of good men under the weather? Especially new ones in business. They fall for it like simpletons! They don't use judgment!"

"Jannett must have had it bad," Reilly commented.

Did It as a Matter of Principle

"Extremely bad!" answered Ben. "He was beyond medical assistance. I don't know whether he imagined he was going to bust a hole in big business or was going to make a bigger profit on what he sold, but he must have done it as a matter of principle, for I don't believe every salesman would have pushed stuff off on him in such quantities."

"Now take myself; I have more money to use in a business way than Jannett would have had if he had stayed in business ten years; I have been in business that long myself. And do you suppose I would want a stock of batteries as big as Jannett had? I could sell them in time, but I can't afford to tie up that

much capital. It's money gone to waste.

"Quantity buying is all right if you can use the quantities, but Jannett never realized what he was doing. He figured that if he bought stuff in quantity and sold it at list he was thereby making a larger profit than if he bought in small lots. He was wrong from the start. Even if he sold the stuff in a year or eighteen months he wouldn't make good on the deal.

How the Thing Figures Out

"In all this quantity buying the merchant has to figure on his turnover. A dollar that is turned over with a profit of 25 cents earns 25 cents, and if it is turned over four times a year it earns a dollar; it doubles itself. If it is turned over but once a year it takes four dollars of investing power to equal that one dollar that is turned over once every three months. Therefore, if Jannett's stock didn't move inside of two years it was costing him eight times as much as it should have to stock his store.

"And that, Reilly"—Ben thumped the desk—"is something some of the best of them in the business never figure on. They don't keep track of their turnovers. I said the dollar could be turned over in three months. This may not always be true. Sometimes it may take longer and a great many times it will not take so long. In the dry goods and businesses that depend on the seasons the turnovers are shorter than they are in trades where a stock is good the year around.

Salesmen Who Treat Buyer Fairly

"Some salesmen won't sell a man big quantities if they are convinced he doesn't need it, and they are the men and the companies that are going to be in business when a lot of these stock-'em-up-and-get-the-money boys are dead and buried. There are a couple of accessory salesmen who have sold goods to me ever since I have been in business, and I have stuck with them ever since the beginning just because they played mighty fair with me.

"They used to advise me when I was new at the game and tell me how much

I ought to buy, and they were always anxious not to see me overstocked with something I couldn't move. They reasoned rightly that if all my capital became tied up in stock I wouldn't have anything with which to buy more stock and might eventually be forced out of business; by that they would lose a customer. It is partly due to their good advice that I am in business today, and I am grateful enough to them to throw all the business I can their way."

Jerry Sullivan Was One

"Jerry Sullivan, Everwear tires?" suggested Reilly.

"Right you are!" beamed Doyno. "Jerry is one of them! One of the squarest lads in the business! The other is Big Jeff Sanderson of the Great Eastern Motor Supply Company, the jobbers. I guess they didn't get to Jannett in time to start him right, or if they did he wouldn't listen to them. He was a bit cock-sure and pig-headed, at that, so I've heard.

"And it beats the Dutch how some young fellows don't know when quantity buying is good and when it is bad. Only the other day a salesman came along when I was out, and he talked to Bett. The salesman had a good line of stuff and I may put some of it in, but when Bett told me the story of what the salesman had told him he was all in favor of a big order.

"I asked him what we would do with a

big order if we took it. He said we could sell the stuff. I asked him in how long and he said it might take a year but that our profits would be bigger. Then I explained to him about that dollar that brings in a quarter four times a year and his eyes opened. He learned something.

"Another thing so many men do, too, is to buy stuff they don't need just because they can get it cheap. They're like the woman who loads up with soap because she can save a half a cent a cake, and takes up more room with it than the saving it worth. Some women ought to be put in a three-room flat where they wouldn't have room enough to store an extra half-dozen turnips."

Reilly smiled covertly. Only the day before he and the manager of the Reilly domestic establishment had discussed this soap problem. Then to hide the reason for the smile and avoid an explanation he said, "There was a fellow in to see me yesterday who had a lot of fine stuff cheap. He wanted me to buy a lot of grease cups; he said they were good stuff and were being sold to close out the stock of a man who went broke.

Enough for a Hundred Years

"I looked them over, and they were good grease cups, as far as I could see; but what do I want with a mess like that? I might be able to use a few now and then, but I wouldn't be able to get rid of the lot in a hundred years. Most of the grease cups I use are from the fac-

tory; I don't monkey with outside stuff. I don't care for much repair work outside what the Sennett owners bring in, and grease cups are a small part of the supply stock in the shop.

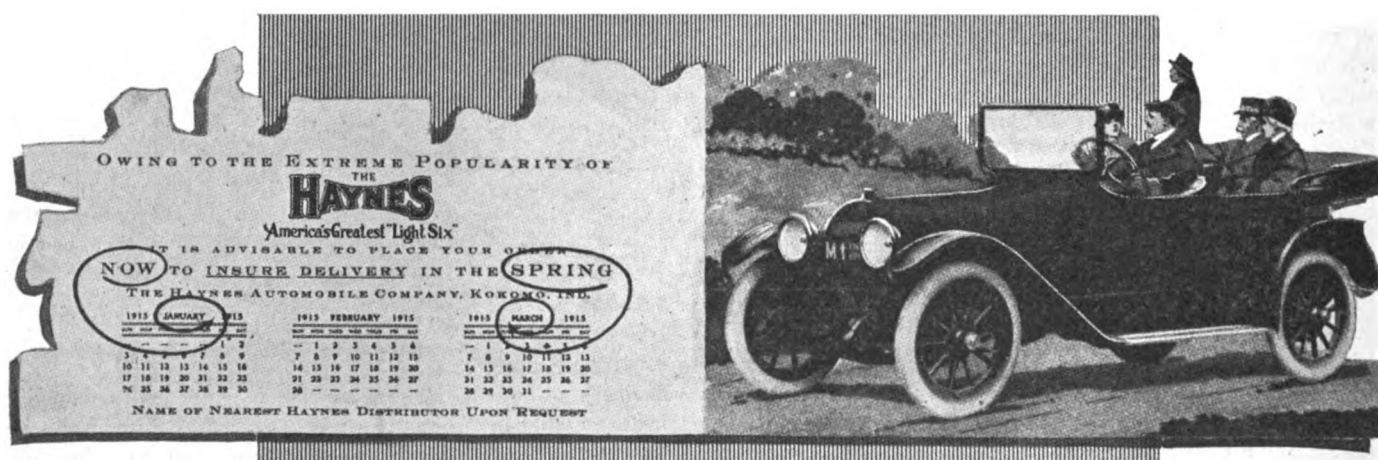
"Theoretically, that may have been a good purchase, but every time I looked at that junk in the stock room and thought of all the good inactive money it represented I would want to hit somebody a clip with the peen of a hammer. It was good stuff, but I didn't need it."

Tonneau Chairs for a Church

"Jannett had some of that stuff, too," laughed Ben. "He had a stock of those tonneau chairs. I showed them to you. Tonneau chairs are all right and are a nice thing to have, but there isn't much call for them in my supply store. Most cars are equipped with auxiliary seats if there is any room for them, and the people who want to squeeze in extra seats are in a very small minority. There are enough tonneau chairs up there to last me twenty years unless I—" Doyno had an idea. "I'll tell you what I'll do! I never can sell them for use in cars! I'll sell them to the new Methodist church! I'll make the price cheap out of charity. You know that church is in my neighborhood and it's up to me to help it along. I can sell those chairs at—"

"Help the church?" exclaimed Reilly. "I think you've got the order reversed! Help the church!"

HAYNES COMPANY SUGGESTS TO PROSPECTS A NEW YEAR'S RESOLUTION



This cut-out, 4-page booklet is being mailed out by the Haynes Automobile Co., Kokomo, Ind., to prospects. The poem which appears below is printed on the inside. The picture of the car, in two colors, is the front cover; the calendar is the back. Folded, it is 5 1/4 inches long

I'm going to buy a motor car,
The best that can be found;
It's famed for flexibility
In states where hills abound.

Makes sixty miles an hour on high,
Can slow down to a crawl,
And there's no need of shifting gears,
'Cause throttling does it all.

It travels twenty miles or more
On a gallon of gasoline,
And cuts the tire and oiling costs
To where they can't be seen.

Its comfort features are unique,
The springs are very long,
And all the steel used in the car
Is light and extra strong.

It's beautiful to look at, but—
I'd rather sit inside,
Reclining on the cushions deep
While joyously I ride.

For years this car will take me
O'er mountains and o'er plains;
I'm going to buy a car that's right—
I'm going to buy a Haynes.

RECENT DEVELOPMENTS in ACCESSORIES

Cutler-Hammer Dimming Switch

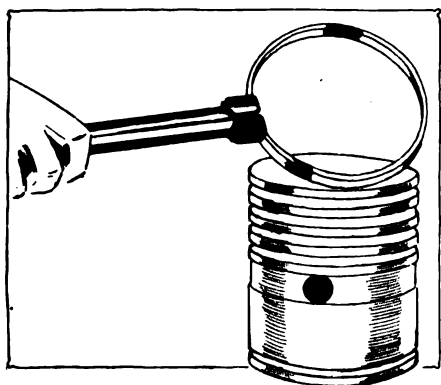
The dimming switches formerly manufactured by the Cutler-Hammer Mfg. Co., Milwaukee, Wis., for series-parallel dimming control, have been superseded by new model, one of which is shown, with wiring arrangement, in the accompanying illustration. The new instrument is more compact and convenient than the older one. A flush dashboard plate carries two push-button switches. One switch turns on the headlights in series, giving the dimmed effect, while the other throws them in parallel, when they burn at normal brightness. The tail light in all cases remains bright. The switch can be used on 6-volt currents or on 12-volt three-wire circuits using 6-volt lamps. Price, \$1.40. The same type of switch can be had with any desired number of buttons.

Folding Shovel for the Tool Box

A shovel that can be put into the ordinary car tool box is manufactured by the Dudley Tool Co., Menominee, Mich. The Bundy folding shovel has a blade $6\frac{1}{2} \times 9$ inches and the full length of the handle is 3 feet. It folds into a bundle 12 inches long, $6\frac{1}{2}$ inches wide and 2 inches thick when the substantial handle joints are separated; the weight is 4 pounds. In addition to doing normal duty when there is a car to be dug out of the mud, the blade of the shovel can be used as a rest for a jack where the ground is soft. The price is \$3. The finish is nickel plate.

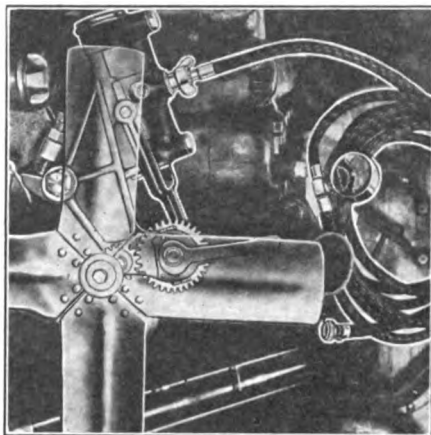
Ford Tire Pump Driven From Fan

The Advance Machinery Co., Toledo, O., has brought out a Ford tire pump



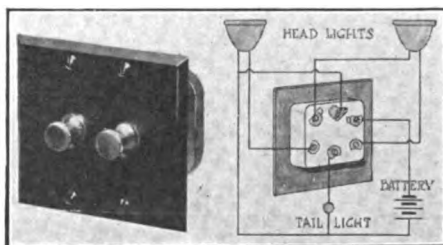
Removing and replacing piston rings is made easier and safer by the McKay-Lees special tool

which is power-driven from the regular fan; it is sold at \$6.50. The outfit includes the pump, driving gears and a special shaft which replaces the regular Ford fan stud, hose and gauge. The



Advance tire pump for Fords, which is double acting and is driven from a special fan shaft

pump is double acting, there being a compression space at each end of the cylinder; the piston is reciprocated by a forked rod which is connected to a pin at the center of the piston, there being



The new Cutler-Hammer dimming switch has series and parallel positions for the headlights

slots in the cylinder walls for the pins to pass through. Drive is from a gear on the fan shaft to a second gear, just above it, carrying a crankpin to which the pump connecting rod is journaled. The second gear is on an eccentric bear-

ing and can be thrown out of engagement by a lever. The piston of the pump is packed with metal rings; the cylinder heads are removable. Discharge valves have $\frac{1}{4}$ -inch steel balls. The piston is lubricated by oil-saturated wicks which wipe on sufficient oil for the purpose but not sufficient to foul the air passing to the tires. Attachment is easily effected without machine work or special tools.

Tool for Piston Ring Removal

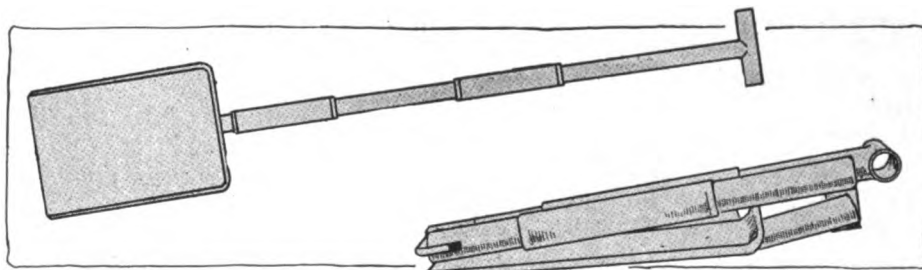
To minimize loss of time and breakage in removing and replacing piston rings the McKay-Lees Co., New Haven, Conn., is manufacturing the piston ring removing tool shown in the accompanying illustration. It is a tong-like tool so arranged that when the handles are brought together the jaws, which are made to catch the ends of a ring at the split, are spread apart, increasing the diameter of the ring sufficiently to permit its passing over the piston. Rings of practically any size can be handled with the tool, which costs \$1.

Dayton Airless Adds Oversizes

The Dayton Rubber Mfg. Co., Dayton, O., has added a number of oversize tires to its Airless line. These are: 33 x 4, 35 x 4, 35 x $4\frac{1}{2}$, 37 x $4\frac{1}{2}$, 37 x 5 and 39 x 5. All have non-skid treads except the 39 x 5, which has a plain tread, and all have plain clincher beads to fit any standard clincher rim.

New Prices on Aeromore Horns

The Fulton Co., Milwaukee, Wis., has reduced the prices of its Aeromore exhaust horns. The new prices, which go into effect immediately, are: No. 1, \$7.50; No. 2, \$6.50; No. 3, \$5.50; No. 4, motorcycle size, \$5. These prices include the usual equipment required for attachment and operation.



The Dudley shovel is big enough to do real work and when folded is small enough for the tool box

Soaps and Polishes for the Garage

Cleansing Mediums That the Supply Dealer Can Stock

Shino—The Pioneer Mfg. Co., Cleveland—Linseed soap is made of vegetable oils and is intended for washing varnished and painted surfaces, fabrics, glass and metals. It is put up in barrels of 500 pounds at 6¾ cents per pound, ½ barrels of 250 at 7 cents, ¼ barrels of 125 at 8 cents, and 25-pound galvanized pails at 10 cents. Shino metal polish, 50-gallon barrels, 75 cents per gallon; 30-gallon, ½ barrels, 80 cents; 10-gallon jacket cans, 90 cents; 5-gallon jacket cans, \$1; 1-gallon square cans, per doz., \$12; ½-gallon square cans, \$8 per case of 12; quart cans, \$8.50 per case of 24; pint cans, \$5 per case of 24.

A-No.-One—International Polish Co., Rochester, N. Y.—This is a body polish which will restore varnished surfaces dulled by steam, oil and oxygen. It is put up in bottles at 50 cents each; pints, 75 cents; gallons, \$5. Dealers, bottles, \$2 per dozen; pints, \$4.50 per dozen; gallons, \$3 each. A metal polish under the same brand is put up in pints at 25 cents; dealers, \$1.50 per dozen; quarts, 50 cents; dealers, \$3 per dozen, and gallons, \$1.25 each; dealers, \$9 per dozen.

Slakup—N. B. Arnold, Brooklyn, N. Y.—This line includes rubber paint for tires in gray or white, put up in pint cans at 50 cents each; engine enamel and aluminum paint, 50 cents per pint; hard body soap in 5-pound pails, \$1, 10-pound pails, \$1.85, and 25-pound pails, \$4; hand-cleaner, in 10-oz. cans, 10 cents; quick acting cream polish, ½-pint cans, 15 cents; pint cans, 20 cents; quarts, 35 cents; ½-gallons, 60 cents; gallons, \$1; clear lacquer for polished metal, ½-pint cans, 75 cents; elastic black metal finish, glossy or flat, ½-pint cans, 80 cents; liquid silver plating solution, 8-oz. bottle, 75 cents; also top dressings, top cleaners, lining dye, leather dressings, paints, polishes and varnish. Dealers, 25 per cent on small lots, 33⅓ per cent on dozen lots and 40 per cent in four-dozen lots. A display case with mirror top, catalog rack and wrapping holder and cutter in the back and twine holder is given to dealers with each \$50 order.

Murphy's—Phoenix Oil Co., Cleveland, O.—An oil soap is made which is entirely vegetable in its composition and is adapted to cleaning of all kinds; it is

good for body work and also is a good hand cleaner. Put up in 450-pound barrels at 6 cents per pound; 250-pound half-barrels at 7 cents; 125-pound quarter-barrels at 7½ cents; 75-pound tubs at 8 cents, and 25-pound buckets at 10 cents. Small cans are put up for the retail trade. Ten-pound cans, 6 and 12 in a case, \$1.25 each; 5-pound cans, 12 and 24 in a case, 75 cents each; 2-pound cans, 24 and 48 in a case, 35 cents each, and 1-pound cans, 24 and 48 in a case, 20 cents each. Prices of bulk goods are net; on small package goods, 25 per cent to dealers.

Dutch Brand—Van Cleef Bros., Chicago—Metal polish, body polish, top and cushion dressing, radiator compound, rim coat and carbon remover are made. Liquid metal polish, ¼ pints, \$1.50 per dozen; ½ pints, \$2.50; pints, \$4.50; quarts, \$7.50; gallons, \$18. Auto-brite body polish, pints, 60 cents; quarts, \$1; ½ gallons, \$1.60; gallons, \$3. Top and cushion coating, ½ pints, \$4.80 per dozen; pints, \$8.40; quarts, \$14.40; gallons, \$3.30 each. Radiator compound for sealing radiator leaks, ½ pint cans, \$5 per dozen; pints, \$9. Rim coat, pints, \$7.20 per dozen. Carbo-cide, carbon remover, gallons, \$3 each; ½ gallons, \$2; quarts, \$1; pints, 60 cents. Dealers, 50 per cent.

Ad-El-Ile—Adams & Elting Co., Chicago—Products are Tire-Ite, tire coating, Shi-Nite, metal polish, Hy-Pol, body polish, black fender enamel, top reviver and varnishes. Tire-Ite, gallons, \$3.50; ½ gallons, \$1.80; quarts, 95 cents; pints, 50 cents. Shi-Nite, gallons, \$1.25; ½ gallons, 57 cents; quarts, 50 cents; 12-oz. cans, 35 cents; 8-oz. cans, 25 cents; 5-oz. cans, 20 cents. Hy-Pol, 5-gallon cans, \$2.65 per gallon; 1-gallon cans, \$2.75; ½-gallon cans, \$1.50; quarts, \$1; 12-oz. cans, 50 cents; 5-oz. cans, 25 cents. Fender enamel, gallons, \$2.25; ½ gallons, \$1.25; quarts, 65 cents; pints, 35 cents. Top reviver, gallons, \$2.25; ½ gallons, \$1.25; quarts, 65 cents; pints, 35 cents. Dealers, 33⅓ per cent.

Utility Renovator—Poughkeepsie, Utilities Corp., Poughkeepsie, N. Y.—A polish and surface remover for varnished surfaces which will remove oil and grease and also road tar. Put up in gallons at \$3; quarts, \$1; pints, 75 cents; ½ pints, 50 cents; ¼ pints, 25 cents.

Auto-Newer—Pimbley Paint & Glass Co., St. Joseph, Mo.—Varnish polish and renewer for exterior surfaces exposed to the weather put up in three sizes: 4-oz. 50 cents; 10-oz., \$1; 24-oz., \$2.

Northwestern Chemical Co., Marietta, O.—Dermaline is a grit hand soap containing pumice and not sand; it is put up in cans at 10 cents; case of 36 cans, \$3.60; dealers, 30 per cent. Klens-ol, a liquid soap, is put up in pint shaker-top cans; price, 25 cents per can; case of 12 cans, \$3; dealers, 40 per cent. This soap is a roadside cleanser and may be used either with or without water.

Energine—Energine Refining & Mfg. Co., Cleveland, O.—Linseed oil soap is manufactured for washing cars; it is packed in barrels, half-barrels and pails of 100, 50, 25 and 10 pounds. Prices, 6 cents per pound in barrel and half-barrel lots; 7 cents in 100-pound lots; 8 cents in 50-pound lots; 9 cents in 25-pound lots, and 10 cents in 10-pound lots.

Standard Varnish Works, New York—A B C reviver is a quick-drying preparation for renewing and preserving the polish on bodies, metal trimmings and leather work of cars. It is put up in cans containing 1 gallon, \$2; half gallon, \$1.10; quarter gallon, 60 cents, and eighth gallon, 35 cents. Dealers, 25 and 10 per cent. Touch-up-Auto black enamel for touching up runningboards, hoods, fenders and other chassis parts, quarter gallons, \$1.50; eighth gallon, 80 cents; sixteenth gallon, 45 cents. Dealers, 40 per cent.

Schein—John F. Bornschein & Co., Chicago—Polishing liquid for wood and leather. It is non-explosive, does not gum and requires no shaking. Price, 12 ounces, 50 cents. Also put up in quarts, gallons and half gallons.

Best of All—Essex Paint Works, Essex, Conn.—This is a metal polish which is put up in liquid and paste forms. It is non-inflammable. Liquid polish, 8-oz. can, 20 cents; 16-oz., 30 cents; quarts, 50 cents; ½ gallon, 85 cents; gallon, \$1.50. Paste polish, 3-oz. cans, \$7.25 per gross; 6-oz., \$14.40; 12-oz., \$28.80; 16-oz., \$36. Cream polish for silver and glass, in screw top 8-oz. glass jars, \$36 per gross. Dealers, 50 per cent.

Advance—Advance Oil Works, New York—A special soap is made of neutral vegetable oils which will not injure highly varnished surfaces, under the name of Lynch's Advance soap. It is

put up in tins, tubs, kegs and barrels. Klenol is a polishing compound of oils, spirit and wax. It is not self drying and is intended to be rubbed until dry. Half-gallons, 60 cents; 1 gallon, \$1. Dealers, 25 per cent. This company also produces all kinds of lubricants, belt dressings and other grease and oil products. The price on Advance soap is 6 cents per pound in barrels, 6½ cents in half-barrels, 7 cents in kegs or tubs, 8 cents in 25-pound tins, 9 cents in 10-pound tins, and 10 cents in 5-pound tins; dealers, 20 per cent.

New Life—H. M. Hallett & Co., Ludington, Mich.—A body polish for cleaning and brightening varnish without injuring it; also good for leather. Put up in screw top cans; 1-gallon, \$3; quart, \$1; 12-oz., 50 cents; 5-oz., 25 cents. Dealers, 33½ per cent.

Corliss—Corliss Supply Co., St. Louis, Mo.—A special polish is made for lamp reflectors and other surfaces which must be brightened without being scratched. It is put up in boxes; price, 10 cents; dealers, ½-gross lots, 50 per cent. A mechanics' "23 for dirt" is put up in cans; price, 10 cents; dealers, 5 dozen lots or more, 30 per cent.

Indianapolis Paint & Color Co., Indianapolis, Ind.—Metal-brite is a polish for cleaning any metal with a bright surface, and is put up in gallons at \$1; dealers, \$8 per dozen; ½-gallons, 60 cents; dealers, \$4.50 per dozen; quarts, 40 cents; dealers, \$2.75 per dozen. Auto-gloss, a cleaner for varnished surfaces, is put up in gallons, at \$1.50; ½-gallons at 85 cents, and quarts at 50 cents; dealers, 33½ per cent.

Rub-Less—Feiner Chemical Mfg. Co., Springfield, Mass.—This polish is designed to do its work with the least possible rubbing. It is not inflammable. Put up in all quantities from ½-pints to barrels and sold only to dealers.

Swastika—McLean Jones Oil & Supply Co., Boston—A special automobile soap which is so compounded as to be harmless to varnish is put up in 1-pound cans at 20 cents; 2-pound, 40 cents; 3-pound, 50 cents per can; 5-pound, 15 cents per pound; 10-pound cans, 14 cents per pound; 25-pound pails, 13 cents per pound; 50-pound pails, 12 cents per pound; ½-barrels, 11 cents per pound; barrels, 10 cents per pound. Swastika metal polish, gallon cans, \$1.20; ½-gallons, 75 cents; quarts, 50 cents; pints, 35 cents; ½ pints, 25 cents.

Finaline—The Finaline Mfg. Co., Inc., St. Louis, Mo.—This preparation is intended for use on new varnish to preserve its brightness; it is not a polish or a paint reviver and cannot be used to bring back the luster to a worn job.

Auto-Body Tonic—Americus Products Mfg. Co., Detroit—This is a body polish which is marketed exclusively through jobbers. It is good for both old and new cars and is applied with a damp cloth. No clay, acids or mercury are used in its compounding. Put up in quarts at \$1; ½-gallons, \$1.75, and gallons, \$3.

Houghton—E. F. Houghton & Co., Philadelphia—A body soap is manufactured. It is so compounded that it will remove road oil and lubricating oil from the varnish. It is put up in barrels of 400 pounds at 6 cents a pound; ½-barrels, 250 pounds, 6½ cents; kegs, 100 pounds, 10 cents; cans, 50 pounds, 10 cents; cans, 25 pounds, 12 cents; cans, 5 and 10 pounds, 15 cents.

U-Auto—The U-Auto Varnish Co., Cleveland—This is a varnish which is applied with cheesecloth, dried over night and leaves a highly polished surface. It will not turn white under the action of water, and is intended to refinish the

surfaces of old cars. It is made in two kinds, one for interior and the other for exterior application. Exterior, ½-pints, 40 cents; pints, 75 cents; quarts, \$1.50; ½-gallons, \$2.75; gallons, \$5; dealers, 30 per cent.

Buffalo Varnish Food—Buffalo Oil Paint and Varnish Co., Buffalo, N. Y.—This is a special compound for cleaning and polishing varnished surfaces and is intended to remove grease, stains and discolorations and leave a high polish. It is put up in 6-oz. bottles, 25 cents; 14-oz., 50 cents; 32-oz., \$1; ½-gallon, \$1.75; 1-gallon, \$3.

New Era—The New Era Mfg. Co., Kalamazoo, Mich.—Oil paste polish is made which is suitable for both varnish and metal and contains neither acid nor alkalis. It is shipped in self-sealing tin pails and cans containing 12½ pounds, 6¼ pounds and 12 ounces.

Dumaco—J. E. Dulin Mfg. Co., Springfield, Mo.—This polish is suitable for body work and leather and all varnished and painted surfaces. It leaves the surface dry. Put up in cans large enough to polish an entire car 10 or 12 times. Price, \$1; dealers, \$4 per dozen for quart cans. Carbon remover is also manufactured. Quart cans, dealers, \$4 per dozen.

HALLOWE'EN ATMOSPHERE AS PART OF TIRE CAMPAIGN



This window display by the Detroit Firestone branch, Thanksgiving week, proved a big drawing card. The central figure, a cardboard turkey cut-out, was furnished by the factory, but the corn shock and the pumpkins were easily secured in Detroit. The idea of this window is purely decorative.

If considered singly, it might be criticised for lack of definite merchandising effort, but when it is recalled that this is part of a continuous series of good, well-planned displays to interest the public in Firestone windows—and tires—it is easily seen that not only is it well executed but has back of it excellent merchandising ideas.

Inflation and Tire Size Are Important

Too Much Inflation Causes Car Deterioration—Too Little Harms Tires

Life Determined by Load and Inflation Pressure—Equipment Evils

Characterizing a pneumatic tire as a "cylindrical ring of air surrounded by a covering of canvas and rubber designed to carry a load and to absorb shocks," Chas. B. Whittelsey, secretary and factory manager of the Hartford Rubber Works, gave an unusually clear conception of what a tire should be expected to do in a paper entitled "Pros and Cons of Tire Inflation," which was read before the annual meeting of the Society of Automobile Engineers. Not only did he tell what a tire might legitimately be expected to do, but he also made very plain just how easy it is for the average individual purposely or without purpose to abuse his tires. And among other things he effectually punctured the idea that an oversize tire properly inflated will not give better service than a regular size tire properly inflated.

"If the cylindrical ring of air is not of sufficient volume," he said, "it cannot do the work for which it is designed. The cylindrical ring of air should be under such a pressure as to permit the tire to carry the load and to absorb the shock. If the pressure of air used in a tire is too great its service will be similar to that of a solid tire, transmitting the shocks in greater volume, thus shortening the life of the car; while a pneumatic tire of proper size and inflation will prolong the life of a car.

Casings Must Be Flexible

"The subjects of proper tire sizes and tire inflation are so closely identified that they will have to be discussed together. The variables to be considered in tire pressures are service, economy and comfort. The nature and construction of the tire cover or shoe should be flexible and yielding, so that it may transmit quickly the shock to the cylindrical ring of air.

"The heat generated within the tire has much to do with the air-pressure used—the faster the speed the greater the heat. The greater the heat the greater the strain, on account of the expansion

TABLE OF CAPACITIES OF DIFFERENT SIZE TIRES

	Rear Wt.	Front Wt.		Rear Wt.	Front Wt.
	Lbs.	Lbs.		Lbs.	Lbs.
28 x 2½.....	225	275	40 x 4	850	1000
28 x 3	350	425	42 x 4	900	1050
30 x 3	375	450	32 x 4½.....	750	950
32 x 3	375	450	34 x 4½.....	900	1125
28 x 3½.....	425	500	35 x 4½.....	935	1175
30 x 3½.....	450	550	36 x 4½.....	975	1225
31 x 3½.....	475	575	37 x 4½.....	1010	1260
32 x 3½.....	500	600	38 x 4½.....	1050	1300
33 x 3½.....	525	625	42 x 4½.....	1200	1450
34 x 3½.....	550	650	34 x 5	950	1200
36 x 3½.....	600	700	35 x 5	1000	1250
30 x 4	625	750	36 x 5	1050	1300
31 x 4	635	775	37 x 5	1100	1350
32 x 4	650	800	39 x 5	1200	1450
33 x 4	675	850	43 x 5	1400	1550
34 x 4	700	875	37 x 5½.....	1150	1400
35 x 4	735	885	38 x 5½.....	1200	1450
36 x 4	750	900			

of air within the tire. Continuous driving generates excessive heat, as well as driving in hot weather. Excessive heat is injurious to the shoe and causes rapid deterioration. If there is not sufficient volume of compressed air within the tire, due to using an improper size, to absorb all of the shock and vibration, the surplus shock and vibration is transmitted to the car and, therefore, shortens the life of the car.

Increase Air, Decrease Heat

"The greater the volume of air in a tire, the less the increase of heat and strain when driving under climatic conditions which produce excessive heat, as well as when driving at great speed or doing heavy work.

"A tire should be sufficiently large not to flatten at the point of road contact more than 14 per cent of its sectional diameter or on an average of 12 per cent, to give good service. A tire of sufficient volume to properly carry a load with proper tire pressure will, if not properly inflated, deteriorate much more rapidly from excessive flexing, causing the fabric to break down quickly, and is much more liable to puncture.

"Still the user closes his eyes to these facts, when he considers only the personal comfort of the occupants of the car, for he well knows that an under-inflated tire will give greater riding comfort, as it absorbs the vibration and shocks more quickly and thoroughly. After he has driven his tire under-inflated

and received a much less than normal mileage from it he is brought face to face with the increase in tire expense which he has brought upon himself.

"The personal equation of the driver has to be considered; the tendency not to see that the tires are properly inflated; the manner in which he drives. The service of the car, whether for light or heavy work, the climate and seasons, the geographical location, the type of roadbed, the use of shock absorbers, the spring equipment and the distribution of the load of the car, are also factors.

"Some automobile manufacturers are inclined to equip their cars arbitrarily with tires not sufficiently large to perform the required service, unless inflated to a pressure making them so rigid as to cause the cars to ride as though equipped with solid tires.

Evil of Under-Size Tires

"This is a short-sighted practice, for the reason that if the user keeps his tires inflated excessively, he shortens the life of his car and increases his car repair bills, and the car maker does not retain the good will of his customer, as he would by putting on tires of sufficient cubical content.

"This condition caused the tire manufacturers to design what is commonly known as the 'oversize tire,' which was first purchased by the car user after he found out that his car was under-tired, and has since been adopted by many automobile manufacturers. For example,

an automobile manufacturer puts on a car that weighs 2,500 pounds, fully equipped with all the necessary accessories, and designed to carry a given number of passengers, 32 x 3½ tires; these tires are overloaded.

Larger Tires Last Longer

"He knows that if the tires do not give service the user will, undoubtedly, buy 33 x 4 tires, which have approximately 25 per cent greater cubical content than the 32 x 3½, but cost approximately 40 per cent more.

"The manufacturer might have equipped the car with a 32 x 4 tire, which is amply large to carry the load, but this would have added about 35 per cent to the tire cost of the manufacturer. He would, however, not only have pleased the car owner with the service from his car and the tires, but insured him a greater mileage on the first set of tires and saved him at least 5 per cent of the tire bill on each renewal.

"It has been stated that an oversize tire properly inflated will not last longer than a regular size tire pumped up to its rated inflation pressure. The oversize tires with their larger cubical content will perform a greater amount of work, because there is less heat developed in them. They will pass over stones and receive the shocks of the road with far less liability of fabric breaks, because of the additional amount of cushion in the air to distribute the strain throughout the greater area. They are less liable to puncture because of their additional strength and carrying capacity, which not only increase the life but afford much easier riding.

Simple Method Brought Trade to the Door

REPAINTING AUTOMOBILES A QUESTION OF ATTENTION TO DETAILS

NOW IS THE TIME TO
CONSIDER RENOVATING AND
REPAINTING YOUR SUMMER
CARS

A GREAT MISTAKE IS
MADE IN PUTTING OFF THIS
WORK MAKING IT NECESSARY
TO RUSH THE PAINTING AT
THE LAST MINUTE WHICH IS
ALWAYS UNSATISFACTORY

THERE ARE SEVERAL
REASONS WHY WE SOLICIT
YOUR TRADE

WE HAVE THE BEST FA-
CILITIES IN NEW YORK CITY
FOR HIGH GRADE REPAINT-
ING AND BODY REPAIRS

FROM THE TIME THE CAR
COMES INTO THE WORKS
UNTIL IT IS FINISHED EX-
PERT SUPERVISION IS GIVEN
IT BY COMPETENT SUPERIN-
TENDENTS-THIS IN CONNEC-
TION WITH THE BEST OF
MATERIALS USED BY HIGH
CLASS MECHANICS INSURES
THE CAR LOOKING LIKE NEW
WHEN DELIVERED TO YOU

WE ARE CENTRALLY LO-
CATED IN THE HEART OF
THE CITY (BROADWAY AND 84TH
STREET) WHERE YOU MAY
COME AND INSPECT THE
WORK AT ANY TIME DURING
ITS PROGRESS

ON RECEIPT OF THE EN-
CLOSED CARD WE WILL FUR-
NISH A DETAILED ESTIMATE
OF WORK NEEDED

LOCKE & COMPANY

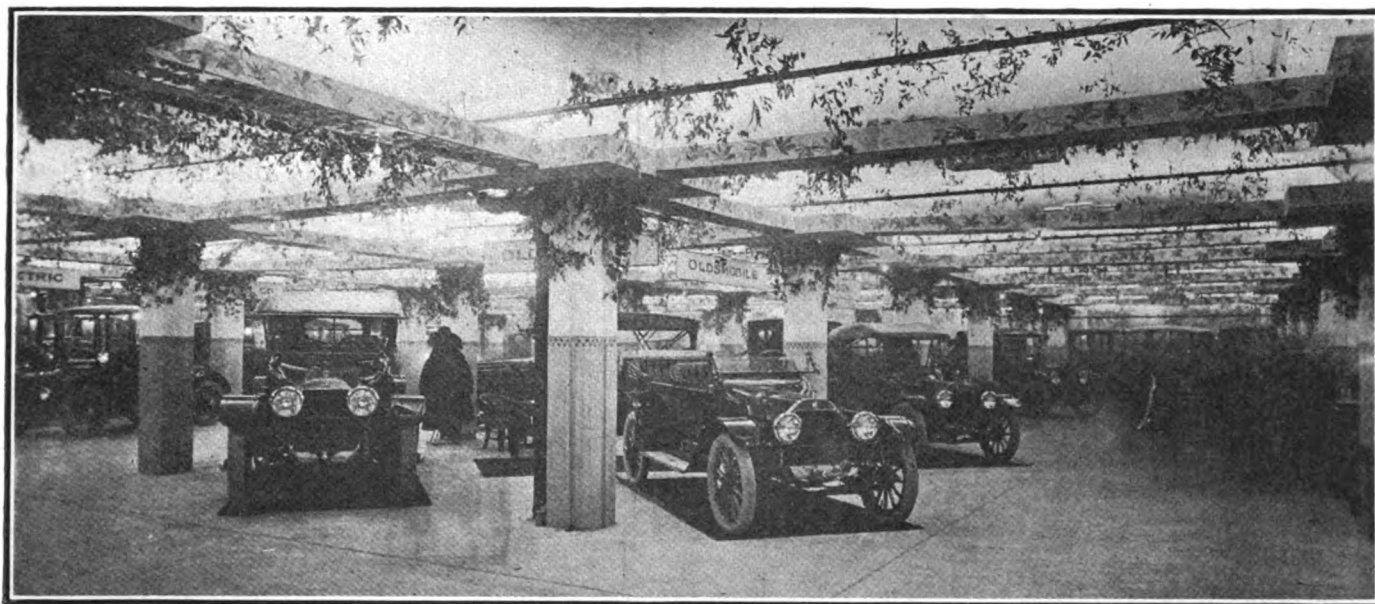
218 West 84th Street New York

This is the inside of a folder about this size which the Locke company sent out to a list of car owners soliciting their business NOW while there is plenty of time to give all attention to painting work. It makes the point that if work is left until later it may not be as satisfactory because not so much time can be devoted to it. With the folder there was enclosed a return postcard, thus making it easy for the owner to give his business to the Locke company

"Tire manufacturers have found from years of experience that tires inflated to a pressure of 20 pounds per cross-sectional inch will give the longest life when driven under normal conditions. For example:

"They are trying to educate the user to see that his tires are kept inflated to this pressure by taking readings with

a tire pressure gauge, of which there are several reliable makes on the market at a moderate price. Adjustments are being made on this basis. As in years gone by, many tire users do not have a pressure gauge, but judge the proper inflation by kicking the tire to see whether it is hard enough. This crude method generally causes under-inflation.



Detroit's fourteenth annual motor car show is housed in the big buildings of the Detroit Lumber Co., three entire floors being occupied by the 203 cars exhibited. Several pleasure and commercial cars are being shown for the first time, and one of the features of the affair is a museum of cars that have helped to make motor car history

New Cars and Trucks at Detroit Show

Fourteenth Annual Exhibition Brings Out Features Not Seen in New York

The fourteenth annual show of the Detroit Automobile Dealers' Association, which opened Saturday evening and will run for a week, broke through the usual custom and was ready for the spectators when the doors opened. There were 203 cars and chassis on the three floors of the big building occupied, gasoline and electric, pleasure and commercial.

Among the exhibits are several cars, in both pleasure and commercial classes, that are new. The Storms Electric Car Co. is showing for the first time its electrics, a roadster at \$750 and a coupe at \$950; both have the same wheelbase of 90 inches and 44-inch tread. The Princess roadster, with four-cylinder block motor, $2\frac{3}{4} \times 4$, and electric starting and lighting, is another newcomer, and sells for \$495 fully equipped; it has a 3-speed gearset, 92-inch wheelbase and 44-inch tread.

The little roadster displayed by the States Cyclecar Co., Detroit, was not seen in New York and will not be at Chicago. It has a four-cylinder block motor, $2\frac{3}{4} \times 4$, 90-inch wheelbase, 36-inch tread and 28×3 tires on wood wheels, and sells for \$365.

A reduction of price of the R-C-H from \$900 to \$775 has been announced; this is for the car without electric lighting and starting. The Ward Leonard system adds \$75 to the price.

Several commercial cars were shown for the first time.

The J. C. Wilson Co., which only recently started to build trucks, has added a worm-driven $1\frac{1}{2}$ -ton model, identical otherwise with its double-chain driven model. The price is \$1,800.

The Dominion truck, built by the New Dominion Motors, Ltd., of Walkerville, Ont., and by the Dominion Motor Truck Co., which has just been organized in Detroit, is a combination truck and trailer having Continental unit power plant. The over-all length is $19\frac{1}{2}$ feet, the wheelbase of the tractor being 68 inches and of the trailer with 12-foot body 89 inches. The total weight including body is 8,585 pounds, of which 2,310 pounds is on the front tires, 3,450 on center tires and 2,825 on trailer tires. The rear axle is a Sheldon worm drive and the trailer axle a Sheldon with roller bearings. The

trailer's capacity is 6 tons and the price of the truck with electric headlight, inside dash light, horn and tools, is \$3,800.

The Denby Motor Truck Co., which has been making a 1,500-pound and a 2,000-pound truck, has added a 3,000-pound and a 4,000-pound model, with $3\frac{3}{4} \times 5$ Continental motors, Westinghouse starting and Kemco lighting. The wheelbase is 144 or 160 inches. The price of the 3,000-pound truck is \$1,900 and of the 4,000-pound model, \$2,100.

The new 1,500-pound International truck, made by the International Harvester Co., sells for \$1,150. It has two opposed cylinders of L-head type, $4\frac{1}{2} \times 5$. The wheelbase is 102 inches and the tires $38 \times 2\frac{1}{2}$ front and 38×3 rear.

An innovation is the "automobile museum." Instead of having early models shown in the manufacturers' stands all the historical machines are gathered together. The cars of 15 or 20 years ago shown in the museum are the first Oldsmobile, made in 1895; the first Hudson, the first Model A Packard, made in 1899; the first Model I Overland, built in 1902; a Pierce-Arrow, built in 1902; the Winton Bullet racing car No. 2; one of the earliest made Winton passenger cars; a Hupmobile which made a trip around the world, and the first Buick, Mitchell, Detroit electric and Baker electric.

Non-Fluid Oil Prices Reduced

The New York & New Jersey Lubricant Co., New York city, has reduced its price on Non-Fluid oil. The old, new and pound rates, respectively, are: 3-pound can, old, 75c; new, 60c; per pound, 20c; 5-pound, \$1.25, \$1, 20c; 10-pound, \$2, \$1.75, $17\frac{1}{2}$ c; 20-pound, \$3.50, \$3, 15c; 50-pound, \$7.50, \$7, 14c.

Aim at Complete Reciprocity

Complete reciprocity under the Federal automobile law, and the abolishment of multiple registration, is embodied in the Adamson measure, which will be brought before Congress at its next session. W. C. Adamson, of Georgia, chairman of the Committee on Interstate and Foreign Commerce, is the author of the measure.

For some time the Adamson measure has rested in committee awaiting a decision by the United States Supreme

Court on what has been known as the "Maryland Case," wherein a resident of the District of Columbia contended that he had the same right as any other vehicle owner to the use of Maryland roads so long as he had provided himself with an identification number from his home district.

The inference in Justice McReynolds' decision that there should be a national law covering the subject, prompted the American Automobile Association to take the matter up with Adamson and to back the measure up in every respect.

Price of Gasoline Down 1 Cent

The Standard Oil Co. of New York has reduced the price of gasoline 1 cent, the new wholesale price to the garage now being 12 cents. The new price to consumers has been set at 14 cents. These prices went into effect Friday, January 15, and are for delivery in sealed steel barrels.

Krit Sale Set for Feb. 5

At the first meeting of the creditors of the Krit Motor Car Co. and the Krit Sales Co., Detroit, Mich., which was held January 18, Frank W. Blair, of the Union Trust Co., was appointed trustee for the former company and Harry Lansdale for the latter. February 5 has been set as the date for the sale of both companies.

Hartford Planning Big Show

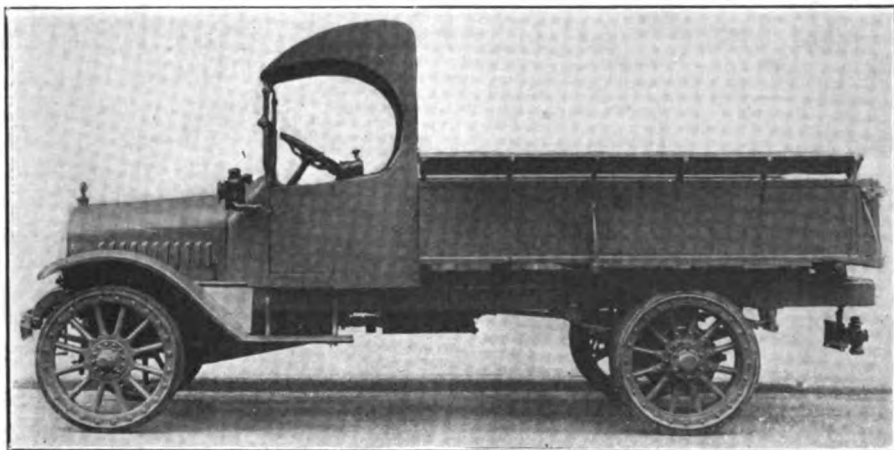
The eighth annual show of the Hartford Automobile Dealers Association will be held at the new State Armory on Broad street the week of February 6-13. The show this year will be under the auspices of the First Infantry, Connecticut National Guard. Present indications point to a bigger show than the Hartford dealers have heretofore staged. The show will be devoted to both pleasure and commercial cars.

New Stearns Distributer in Kansas

The White Motors Co., Kansas City, Mo., has been appointed wholesale and retail distributor of Stearns-Knight cars for Kansas City, the State of Kansas, western Missouri and northern Oklahoma, by the F. B. Stearns Co., Cleveland, O. W. T. Scarritt is treasurer and acting manager of the Kansas City White company.

Hupp Opens Factory School

The Hupp Motor Car Co., Detroit, has established a factory school for employes. R. G. Blaine, son of Professor Blaine of Belfast, Ireland, is in charge. Two meetings will be held each week at which factory and outside experts will speak.



In the 1- and 2-ton worm-driven Mack trucks the cab has high doors and a glass front. The top is easily removable without spoiling appearance

Worm Drive in Two New Mack Trucks

Latest Models, of 1 and 2 Tons Capacity, Also Have Novel and Practical Driver's Cab Arrangement

British ideas prevail in the design of the new worm-driven Mack 1- and 2-tonners which the International Motor Co., New York city, has brought out. These models mark the entry of one more maker into the worm-drive field.

Most prominent among the characteristics of the new Mack is its cab design. The hood, fenders and cab are all designed as a unit, of pressed steel, and have sweeping curves. The curves, however, are not suggestive of the prevailing trend in passenger vehicle exteriors, but appear distinctly utilitarian and substantial. The cab has high doors, a deep cowl, and the hood merges with it by a gradual slope from the radiator. The fenders are well winged to the frame, easily curved and slightly crowned. A novelty in the cab is a detachable top. This top may be removed without its absence being conspicuous, but when in position gives the impression of being integral.

The chassis itself is founded on a pressed steel frame, straight throughout its length with integral spring horns and a substantial channel bumper in front of the radiator. Flat semi-elliptics support it and it is braced with the minimum of cross-members to afford the flexibility that is now so much sought.

The rear axle is a Timken-David Brown, propulsion being through the springs. Three universals are used in the two-part driveshaft, an intermediate bearing being hung approximately halfway between the gearset and the axle to

reduce the free length of the shaft, thus eliminating any tendency to whip. The gearset and clutch are united with the motor assembly, the former being of the three-speed selective pattern and the latter of the dry-disk type with twelve disks.

The cylinders are cast in pairs, 4 x 5, the valves being located at the right. The pump and magneto are driven by a cross-shaft in front of the motor; the centrifugal pump is at the right and the magneto at the left. The spark-advance on standard models is fixed, although on special order hand advance may be obtained. The motor has a sealed governor located within the camshaft gear. It is set at 16 miles per hour.

The radiator is of the square-tube type, mounted on trunnions within a padded cradle. Control is by left-side steering wheel and central levers, the gear-

shift quadrant and brake ratchet being mounted on the gearbox cover. An original mounting of instruments is provided under the deep cowl and protected, though visible because of the height of the latter. The instrument board is mounted direct on the back cylinder, the faces of the oil pressure gauge, the magneto switch, the carburetor adjustment and the speedometer being flush with the inside of the dash. The magneto is driven from behind the gearbox, the shaft being almost straight.

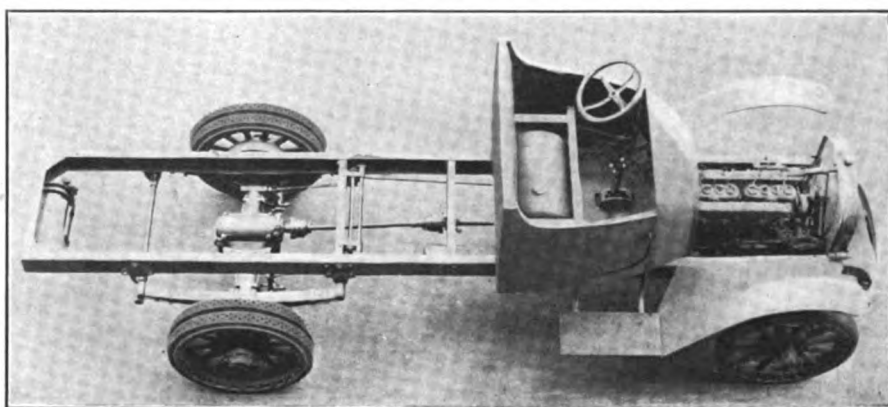
Both sets of brakes are located on the rear wheels, the hand brake being internal and the foot brake external. Timken bearings are used throughout.

The wheels are of wood with square spokes, those of the dual-tired rear wheels being centrally located in the felloes. They carry 36 x 4 tires, single in front on the 2-tonner and 36 x 3½ on the 1-tonner.

Wheelbases are 144 or 162 inches, the shorter one permitting a complete turn in 50 feet.

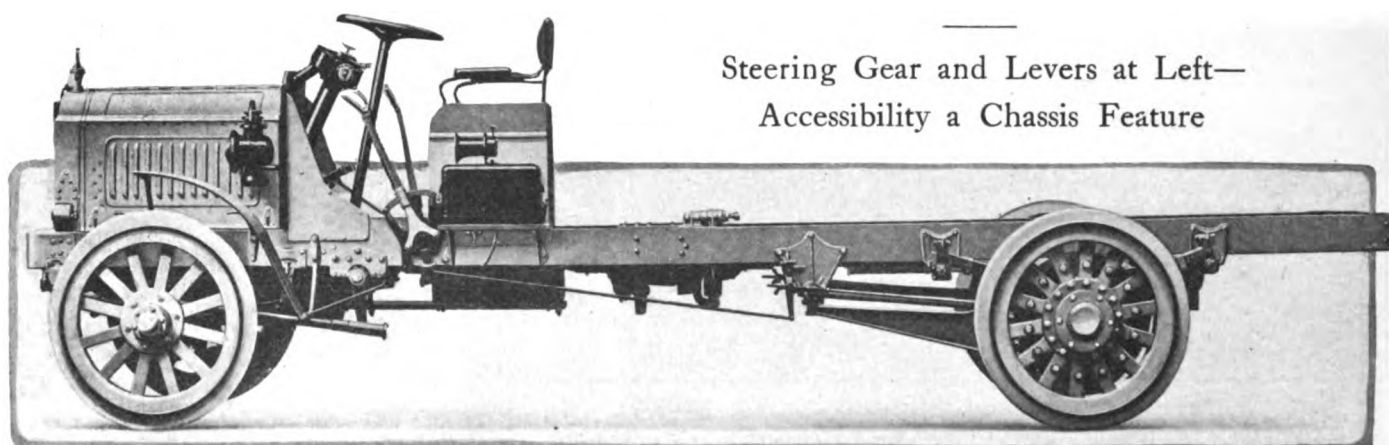
Davidson Rings in A. C. A. Test

A comparative test of piston rings, in which the conventional type of eccentric ring with plain joint was tried against the Davidson multiple ring, manufactured by Davidson's Repair Shop, 139 West 39th street, New York, was made recently by the Automobile Club of America, New York. The motor used was a Pierce-Arrow six, 4½ x 5½, and records were taken of frictional losses, compression, power and fuel consumption. With the Davidson rings a slightly better compression figure was obtained than with the plain eccentric rings, and the multiple rings showed less friction by from 7 to better than 30 per cent. In fuel consumption there was no difference and neither type of ring permitted much oil to pass, though the tests were not of sufficient duration to give accurate comparative data on this point.



Body removed, showing overttype worm, straight frame construction and driver's seat with gas-line tank underneath and the cab top removed

Centralized Control in Worm-Drive Packards



The new Packard 3-ton truck which has over-type straight worm drive rear axle. Throttle and electrical control are centralized in the control board mounted in front of the steering wheel, three levers on the top working over saw-tooth sectors; the spark coil is mounted on the left side of the board

Additional information which now has become available concerning the new line of worm-driven commercial vehicles which has been brought out by the Packard Motor Car Co., Detroit, Mich., reveal that the design is fairly bristling with new features. The new line embraces models from 1 to 6 tons capacity, the 1-ton model being new and the first vehicle of the lightest capacity the Packard company has produced. Only the prices of the 2-, 3- and 4-ton models have been divulged, these being \$2,800, \$3,400 and \$3,800, respectively. Where desired, Packard-Bijur electric lighting and engine starting equipment will be added at \$225 increase in the price.

All of the new models are equipped with four-cylinder motors and all have a form of the unique centralized control which has featured Packard passenger cars of later design. It is used in conjunction with left drive and left gearshift and brake levers. Mounted directly in front of the steering column, this control board has on it the controls for the carburetor and the electric system. On the upper surface of the board are three levers working in saw tooth sectors. These control the auxiliary air supply for the carburetor, the spark timing and the throttle. On the left side of the control board is carried the spark coil and its switch, metal conduits enclosing all wiring. The control assembly is not attached to the steering column, but rather has a separate supporting column of its own within which the various control rods run to their objective points under the hood.

Another conspicuous feature of the new trucks is the worm drive and its construction. The worm is mounted over the wheel and is a straight type of steel, while the worm wheel is a spe-

cial gear bronze. The worm is mounted as a unit in a special steel carrier, which is bolted in place in the center housing of the axle. Due to this construction, quick removal of the worm, worm wheel and differential is possible.

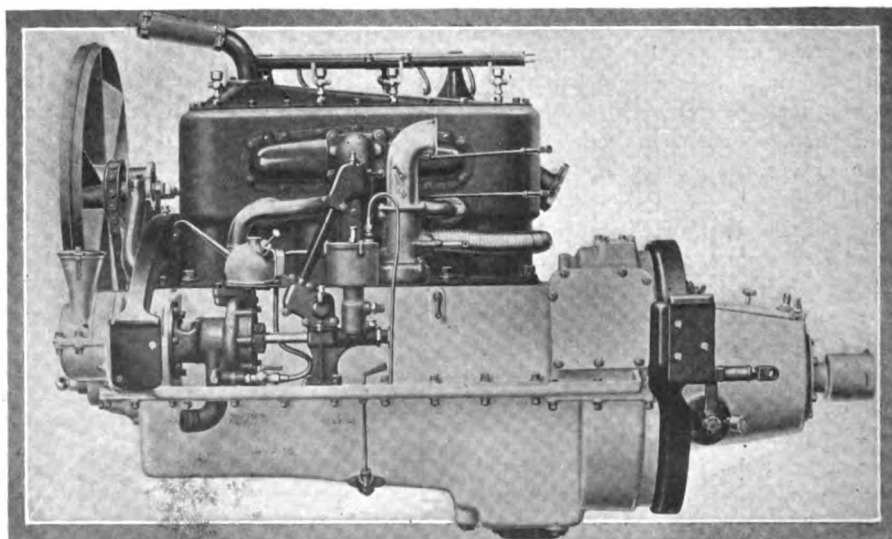
The new Packard final drive is incorporated in a built-up rear axle with the weight of the truck carried on heavy steel tubes which are pressed hydraulically into a rigid central housing. The lower part of the axle housing forms an oil reservoir and the worm in running in the oil thus contained draws it up to the contact surfaces, affording constant lubrication for worm and wheel and thrust bearings.

Tubular radius rods remove the driving strains from the springs, and a steel torque arm hinged to the front of the worm housing and supported at its front end by a tubular cross member absorbs the torque.

The differential ends of the axles contain six integral splines, closely fitted into keyways in the differential gear hubs. Forged integral with the outer ends of the shafts are large flanges with four tongues. These tongues engage, with a few thousandths of an inch clearance, corresponding slots in steel plates which are keyed and bolted to flanges on the outer ends of the wheel hubs. It is pointed out that this design permits relative motion between the wheels and driving shafts, so that play in the wheel bearings cannot cause breakage of the shafts due to bending.

Another special feature is the provision made for equipping of a power take-off so that the power of the truck motor may be utilized to drive external machinery. This is specially advantageous under certain conditions and gives another usefulness to a truck.

The mounting of the radiator is also



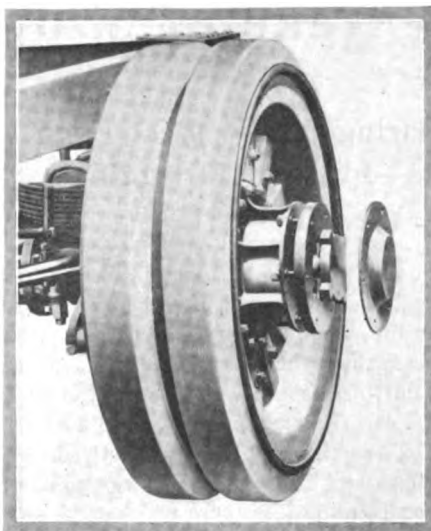
Carburetor and governor, both of which are automatic, are mounted on the left side. Hand control is through a secondary throttle

of special design, though the principle involved is not new. It is flexibly supported on the frame side members by springs which protect it from road shocks. The mounting being independent of the hood, frame weaving does not strain the unit. The radiator is a cellular type and fitted with a Motometer.

Although all six units of the new Packard series are of similar general design, complete details of the 1-ton and the two heaviest models are not yet forthcoming. They will not differ from the 2-, 3- and 4-ton types except in dimensions and certain other details made necessary by their differences in capacity. While the specifications and general design as here brought out apply specially to the three intermediate models, they may be regarded as representative of the whole line.

The motors are of four-cylinder L-head block type and are placed in forward hoods ahead of the driver. The 2-ton has 4 x 5½-inch engine, rated by the S. A. E. formula at 25.6 horsepower, and the 3- and 4-ton models use a 4½ x 5½-inch size, which is rated at 32.4 horsepower.

They are alike in every respect and are carried in the frame by a three-point method of suspension by means of separate supporting members. An arched cross piece at the front affords a member from which the center of the front of the crankcase hangs, while at the rear a yoke piece which bolts between the flywheel and clutch housings gives support at either side rail. This makes it easier to remove the motor unit. By taking off the radiator and the intervening motor



Rear wheel with hub cap off. Driving dogs are integral with axle ends

connections the entire unit may be displaced without hoisting.

The carbureter, water pump and governor are placed on the left side, while the valves and the magneto and exhaust header are carried on the left. Thus the fuel goes through cored passages in the cylinder casting to the intake ports, aiding vaporization.

The crankshaft and camshaft each have four main bearings; they are drop-forged and heat-treated parts. The crankshaft bearings are babbitt-lined with bronze backs and are in the upper half of the crankcase. Tungsten steel valves are used and compound piston rings are fitted. The two lower grooves in the pistons are fitted with four rings each, while the upper groove has a single

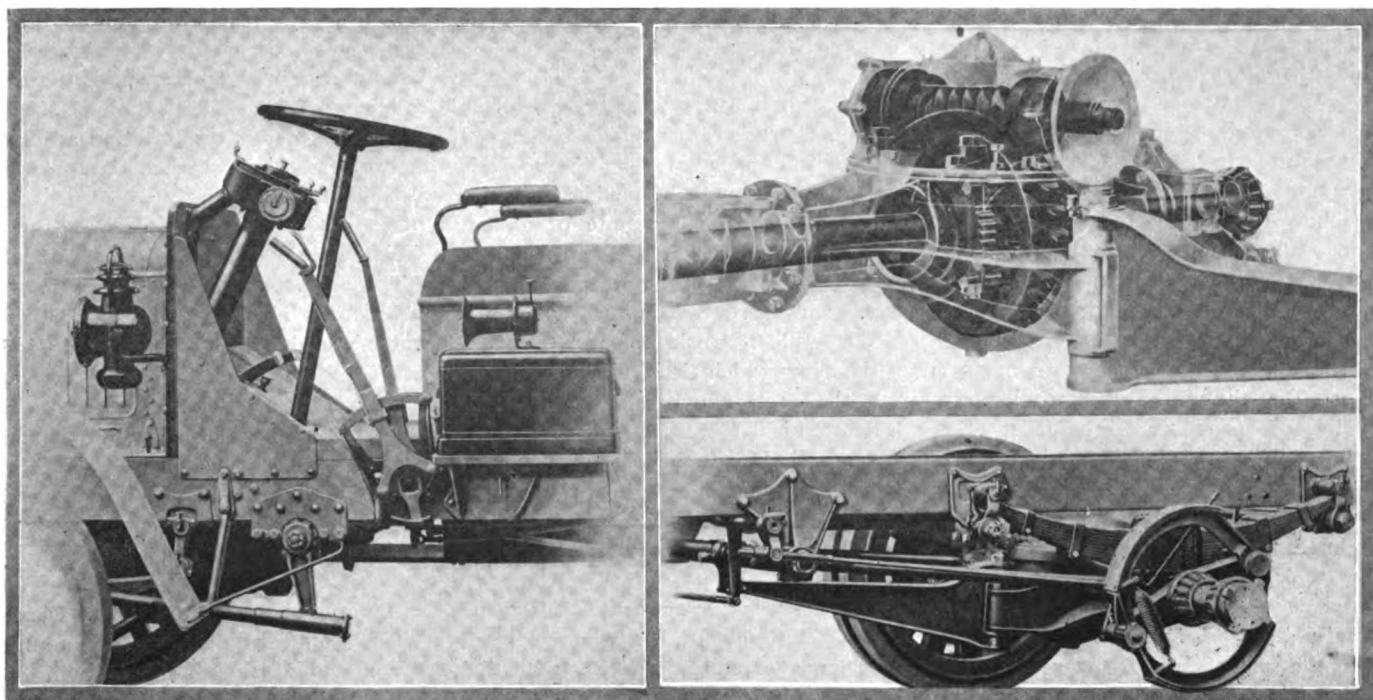
ring. The automatic governor provides an option of speed varying with the model. A lever on the control board operates the automatically-controlled throttle within the speed determined by the truck owner. The entire mechanism is enclosed and sealed against tampering. The governor is a centrifugal type, and in the 3- and 4-ton models limits the maximum motor speed to 1,000 r. p. m., which corresponds to a speed of about 12 miles per hour with the standard axle.

The Packard form of dry-plate clutch housed in unit with the motor is used. The gearset, which adheres to the progressive principle of gear changes that has featured all cars of this make, is a separate unit and is supported at three points by pressed-steel cross members. It is located about amidships of the chassis and drives through a propeller shaft with double universal joints.

Springs are half-elliptic front and rear, and there are two sets of brakes. The service brakes are contracting shoes on a drum on the propeller shaft. This drum is just back of the gearbox. The emergency brakes expand internally on the rear wheel drums.

The wheels are of the usual artillery type and have single solid front tires with dual solids in the rear. The 2-ton specifications call for 34 x 4 tires all around; the 3-ton uses 36 x 5, and the 4-ton requires 36 x 5 fronts with 40 x 5 rears.

Wheelbase may be either standard or long. The 2-ton may be had with either 12 feet or 14 feet wheelbase, and the 3- and 4-ton models with 13 feet or 15½.



Left—Left side of 3-ton chassis, showing control mounting for motor, carburetor and electrical system and electric horn. Upper—Phantom view of straight worm and differential; also torque arm connection details. Lower—Unusually substantial torque arm construction and brake mountings

Business Flows in Wake of Show

New York Dealers One in Declaring Show "Best Ever"— Big Prospect Lists the Rule—Interest Unflagging

The New York show, which closed its doors January 9, did more to create interest and to stimulate demand on the part of the buying public than did any of its predecessors. And what is more to the point, the interest it created and the demand it stimulated is of a more lasting character than ever before. That, in brief, is the consensus of opinion of the New York dealers whose products were displayed in Grand Central Palace.

Just why this should be so no dealer vouchsafed an opinion. Yet all of them agree that the bright particular feature of the show was the preponderance of genuine prospects as compared with other shows.

Business Exceeded Expectations

That quite a number of cars would be sold at the show was to be expected. Yet, in view of the results of previous shows, dealers were not in the least ready for the genuine rush of business which came with the show. As one concrete example in point, the Maxwell branch disposed of six cars, whereas last year but one was sold at the show. The ratio of sales is not so great with other dealers, though it is great enough to make plain that business this year was far ahead of any other year. The Colt-Stratton company, for example, sold no less than 55 Dodge Bros. cars; the C. T. Silver Co., which handles Peerless and Overland, closed up 66 sales at the show and since then has closed 18 more.

But the sales made actually at the show are of secondary importance, for the show is intended to create interest which will develop sales for many weeks to come. Just how this last show may be expected to work in this respect is illustrated best by a few examples.

A. R. Camp, of the Chalmers company, reports that the names of approximately 800 live prospects were obtained at the show and that 20 of them since have signed contracts; it is expected that at least 25 per cent eventually will become Chalmers owners. The Chevrolet company took down the names of some 500 prospects which already have resulted in 40 sales, and the sales are keeping right up at the rate of four or five a day.

The King eight-cylinder car created sufficient interest to warrant the collec-

tion of some 400 names by the local dealer. Five or six of these were closed at the show, as were 12 subdealers, and since then a dozen more cars have been sold to prospects obtained at the show. W. H. Webster, of Webster-MacGowan Co., Regal distributor, was reticent with regard to the number of cars sold, but was frank in his statement that the show was the best he had ever attended insofar as live prospects are concerned.

The Sidney Bowman company, Oakland distributor, collected a list of 156 prospects, from which 15 sales already have resulted and from which at least 25 more confidently are expected. One salesman admitted that during the week gone by he has closed two sales from show prospects.

A. L. Newton, of the Buick company, stated that the business done at the show was "very remarkable" and that the steady upkeep in interest and sales since the show has been even more remarkable.

W. C. Poertner, who is at the head of the Poertner Motor Car Co., National and Jeffery distributor, disposed of eight Nationals and six Jefferys at the show and during the week gone by has closed up five more Nationals and six Jefferys as a result of the show. From a sales point of view, Poertner says, the show was the best he ever attended.

Many Out-of-Town Dealers

F. A. Crook, of the Studebaker branch, is another who reports that the continuance of interest created by the show is phenomenal, though he could ascribe no reason for this happy state of affairs. Since the show no less than 35 Studebaker cars have been sold to show prospects, and there remains a list upward of 300 still to work on. One feature of the show which Crook remarked upon was the great number of out-of-town dealers which it drew.

Harry S. Houpt, Mitchell distributor, admits to selling 25 cars during the show to retail purchasers, this being in addition to a number of wholesale sales.

Changes Among Prominent Tradesmen

W. C. DuComb, Jr., has been appointed sales manager and engineer for Barthel & Daly, New York, sole importers of Shafer ball bearings.

W. J. Drumpelmann has been appointed district manager for the Olds Motor Works, with headquarters at the Lansing, Mich., factory. E. A. Hart, D. E. Ford and F. A. Gross, formerly factory representatives, have been promoted to the positions of Central, Southwestern and Southeastern district managers, respectively.

St. Louis Service Station for Remy

The Remy Electric Co., Anderson, Ind., has appointed the Vehicle Top & Supply Co. its St. Louis, Mo., service station. A full stock of repair parts will be carried and the department will be in charge of a Remy factory mechanic.

Robert Cartmell to the Coast

Robert Cartmell, son of President Van H. Cartmell, has been appointed general representative throughout the Pacific Coast for the Kelly-Springfield Tire Co. His headquarters will be at the company's branch, 1110 South Main street, Los Angeles, Cal.

New York Garage Organizers Disagree

Following a disagreement between Harry Waring and Lawrence Gregory, both of whom had done preliminary work in the organization of the United Garage Associations of New York State, which was formed in New York city during the motor car show, Gregory this week incorporated the Garagemen's League, Inc., and has formed a tentative alliance with James J. Fero, Inc., 796 7th avenue, New York, a supply jobbing house. It is planned among other things to make this house a buying headquarters for the league members. Besides Gregory, the incorporators are Frank W. Lane and George D. Brown, of the Fero company. The capitalization is \$10,000. The plans of this organization are similar to those of the United Garage Associations.

Harvester Adds 1,500-Pound Model

The International Harvester Co. has added to its line a 1,500-pound, 2-cylinder, water-cooled delivery car, styled Model E, of 102-inch wheelbase and 20 horsepower. It has a steel frame, semi-elliptic front springs, I-beam front axle and a larger body than is used on Model M, the 1,000-pound model. Dual ignition is by magneto and dry cells. Drive is by chains and countershaft.

Menominee and Marinetto to Show

The Motor Car dealers of Menominee, Mich., and Marinetto, Mich., will hold a show February 4-6 in the Armory building in Marinetto.

BOSTON GARAGE RULES DO NOT INCLUDE SEPARATORS

**Regulations Made Effective Last Week—
Are Not Drastic—Result Is Due
to the Efforts of Trade
Associations**

The new garage rules worked out by the trade of Boston and Fire Hazard Commissioner John A. O'Keefe went into effect last Friday, January 15. While they require certain alterations in existing buildings and cover all new structures the installation of separators is not imperative, and therein the garagemen and dealers consider that they have won a victory. Their associations cooperated with the commissioner in the formulation of the rules and many mutual concessions resulted.

All garages built in the metropolitan district hereafter will have to conform to all the rules. For existing garages very few changes will be necessary, but such changes as are to be enforced must be made before June 1 next to conform to the rules.

It was first thought that the small private garage, housing one to four cars, particularly the small backyard portable types, would be exempt, but the commissioner rules that they are not, and even such structures must have a three-inch concrete floor.

Few changes will be needed in the big public garages, because they had already been ordered remodeled under a state law last year. Only such existing structures as are within 50 feet of another building will have to make many alterations.

There are now three classes of garage instead of five. The first class must be fireproof and is the only one that may be erected within the fire limits of the city; the second class must have non-combustible exterior walls and protected interior walls and roof, not more than three stories high, and may be as near as 12 feet to other buildings except hospitals, schools, churches, theaters, etc.; the third class may be built of combustible materials but must have a three-inch concrete floor.

Separators are not required except where the commissioner believes it is absolutely necessary. Smoking will bring a suspension of the license to do business. Garages which are in dwelling houses of the owners may not contain more than two cars. Any private garage with more than two cars must be 50 feet

away from any other building. Pits are permitted in garages where the pits are properly equipped with means for ventilation.

Milwaukee Supply Dealers Association

The new organization of motor car supply and accessory dealers which has been in process of formation for several weeks has now been effected and the association incorporated under the name of Wisconsin Automobile Business Association of Milwaukee. There is no capital stock. The articles state the purpose to be to promote the interests of Wisconsin dealers in motor cars, accessories, supplies, etc. The association will aim to establish and maintain cordial relations between all persons interested in the various branches of the motor car industry and eliminate so far as possible the price-cutter. A credit bureau will also be maintained to watch for dead-beats.

The big tire companies which have branches in Milwaukee are represented in the membership. Officers have been elected as follows: President, Jesse A. Smith; secretary, Roland Moeller; treasurer, Oscar F. Fishedick, all of Milwaukee.

Milwaukee Dealers' Show On

Cars, accessories, tires and trucks constituted the four departments in the show of the Milwaukee Automobile Dealers Association which began last Friday night and will close Thursday, January 14.

While the show is essentially a retailers' affair many of the exhibitors are state distributors of their product, and the exhibit is more or less state-wide in its nature. The majority of the exhibits are of cars taken from salesroom floors, there being few polished chassis or other factory materials. Bart J. Ruddle is manager and the Auditorium is used to house the show.

Gas Down 1 Cent in Boston

The price of gasoline has dropped 1 cent in Boston. The Standard Oil Co. has lowered its wholesale price to 13 cents. At the same time a cut of ½ cent in the price of kerosene has been made, the new price of the oil being 8 cents a gallon.

Stewart-Warner Stock Listed

The Listing Committee of the New York Curb Market Association has admitted to quotation the 100,000 shares of common stock of the Stewart-Warner Speedometer Corporation of the par value of \$100.

11 CARS NOT SHOWN IN EAST AT CHICAGO SHOW

**Eight Gasoline and Three Electric Makes
Added for Western Exhibit—Most
of New York Display to
Appear**

As in previous years the Chicago show, which will hold the boards January 23 to 30, is of such magnitude that it has been necessary in order to stage it properly to lease three of the largest exhibition buildings in the city, the Coliseum, the Coliseum Annex and the First Regiment Armory.

The exhibits have been assigned to the following spaces: Gasoline passenger cars on the main floors of the Coliseum, the Annex and the Armory and in the basement of the Coliseum; accessories in the Coliseum balcony and basement, Armory gallery and second floor of the Annex, and electric passenger cars along the center aisle of the main floor of the Armory. There will be no truck display.

Almost all of the original New York cast will take part in the Chicago production. In the gasoline vehicle section the following cars, not seen at the New York show, will be on display: Abbott, Austin, Glide, Lambert, Crow, Pratt-Elkhart, Paterson and Vixen. Chicago also will have an augmented cast of electrics, the American, Milburn and Woods having been added to the six makes exhibited in the East.

Nine makers of gasoline-drive cars who had space at New York will not be represented. Their products bear the following trade names: Crawford, Cunningham, Malcolm, Fischer, Grant, Kline, Owen, Pilot and Reo. This defection will not spoil the record of the Chicago show, which always has had more makes of cars on display than New York could boast of, the absentees numbering nine and the additions totalling eleven.

The Chicago show always has been a dealers' show, a big sales impetus, and this year's exhibition will be no exception. More than 18,000 invitations have been mailed to dealers and garagemen of the Middle West and if the acceptance anywhere near approaches that of previous years dealers will be prominent in the crowds that will throng the three buildings afternoon and night.

Ohio Thinks it Smells Gasoline

In the new Ohio state building code, which has been drawn by a code com-

mission to be submitted to the Ohio General Assembly, provisions are made for waste pipes in garages to take care of possible leakages of gasoline. This change was made following several explosions in Cincinnati sewers which were attributed to gasoline.

Ross & Young Eight at \$1,350

The Ross & Young Machine Co., Detroit, Mich., prominent in the parts and machining business of the city and heretofore concerned in the making of automobiles for another concern, has entered the car-making business itself with the Ross eight, which is to sell for \$1,350 in five-passenger touring form. The eight-cylinder engine is made by the concern in its own factory and has the usual two blocks of four cylinders arranged on the common crankcase at an angle of 90 degrees to each other. The cylinders have a bore of 3 inches and a stroke of 4½ inches, and there is nothing in the V between the two blocks except the carbureter. The camshaft is above the crankshaft and drives through silent chain. The three-bearing crankshaft is the same in form as that used in eights already brought out. Connecting-rods attach to it in hinge fashion.

The Stewart vacuum system of fuel feed is employed, and oiling is by force feed to the cylinder walls, the crankshaft and the camshaft. The starting and lighting equipment is of the single unit type, the combined motor generator being placed on the gearbox and driving through silent chain to the flywheel with a 3 to 1 reduction.

The motor is three-point suspended and by having the three-speed gearset integral with it, forms the usual unit power plant design. Other specifications of the car are 115-inch wheelbase, 34 x 4 tires on wood wheels, open driveshaft fitted with two Spicer universals and Timken front and rear axles, the latter being a floating construction. The rear springs are long three-quarter elliptics. Finish of the Ross car is very attractive, the upholstery being Spanish leather.

John L. Ross states that his concern is taking steps to perfect a dealers' and sales organization and that from 500 to 1,000 cars are to be marketed this year.

Johns-Manville Chicago Exhibit

As was the case during the New York show, the H. W. Johns-Manville is preparing to duplicate in Chicago during the Chicago show the comprehensive exhibit which it staged in its own quarters in New York. The Chicago exhibit will be at 1428 Michigan avenue and will include all the various J-M accessories.

ATTEMPT TO CUT PRICES RAISES SMALL TEMPEST

Used Car Dealer Would Advertise New Cars at a Reduction But Could Not —Brings Up Advertising Censorship Question

Somewhat of a tempest has been aroused in Boston as a result of cut-price sales, and now there is talk of taking the matter to the courts. The L. M. Cotton Co. got hold of some new 1915 Buicks from the Brockton, Mass., agents, whose contract had been cancelled. These were offered at a profit to the Boston distributor who originally sold them to the Brockton, Mass., man. He would not pay the price. Then they were to be offered at cut prices and an advertisement was written out for the papers.

A committee of three members of the Boston Automobile Dealers Association went to the papers and explained the situation from their point of view. The ad did not appear. As a matter of fact, no order was received to run the advertisement. Later, another advertisement was written and sent to the papers. This was not printed, and as no excuse was offered the Cotton company is said to have planned to take legal action.

This company is controlled by Frank Wentworth, who is a partner with Harry Fosdick, handling the Hupmobile line in New England. There was so much talk at the New York show about the trouble that eventually President Drake of the Hupmobile company was drawn into the controversy. Whether it will go farther and result in more serious trouble is what is bothering some of the dealers.

If the bars are let down so that the used car dealers can get hold of a few new cars out of town and offer them at cut prices in a big city like Boston, they fear it will wreck the legitimate dealer, who has built up a business through hard work and display advertising. The question at issue now is whether a newspaper may refuse or censor ads of used car dealers to protect dealers in new cars.

Washington May Increase Fees

Increased fees for motor cars ranging from \$5 to \$17.50, depending upon the horsepower and weight of the car and the use to which it is put, are provided in a new automobile license law drafted by I. M. Howell, Secretary of the State of Washington, and will be introduced

at the legislature now in session. The bill also provides that number plates, which are to be furnished by the state, bear prominently the year in which they expire.

Chauffeur's licenses at \$2 a year also are provided, with the restriction that no person under the age of 21 is to be so licensed.

Aside from this measure it is expected that an attempt may be made to limit the activities of passenger carrying motor buses. One proposal has been to place their operations under control of the public service commission.

Boston Contemplates Market Report

The Boston Automobile Dealers Association is to hold a meeting next week at which action will be taken relative to the Used Car Central Market Report that originated in Chicago and is being extended to New York, Philadelphia and Boston. President John H. MacAlman of the dealers association attended the meeting during the New York show when the matter was discussed.

Mansfield Buys Wells Company

The entire business and factory of the R. C. Wells Mfg. Co., Fond du Lac, Wis., producing lighting, starting and ignition systems, has been purchased by Richard H. Mansfield, for 14 years secretary of the Cutler-Hammer Mfg. Co., Milwaukee, maker of the Vulcan gearshift. Mansfield retires from the Cutler-Hammer company and has taken charge of the Fond du Lac plant. He has been identified with the electrical manufacturing business for 23 years. The Wells company was organized in 1911 and manufactures a large line of coils, generators, cranking devices, switches, etc.

Apple Charges Starter Infringement

Vincent G. Apple, president of the Apple Electric Co., Newark, N. J., has filed suit against a New Jersey dealer in a car which is equipped with the Delco lighting and starting system; this system is alleged to infringe patent No. 1,079,090, issued to Apple November 18, 1913.

Olds Sales 624 Per Cent Better

According to Sales Manager J. V. Hall of the Olds Motor Works, Lansing, Mich., 624 per cent more Oldsmobiles were shipped from August 1 to December 1, 1914, than during the corresponding four months of 1913. The increase credited to New York city was 540 per cent; Chicago, 330 per cent; Los Angeles, 200 per cent; Detroit, 150 per cent; Pennsylvania, 391 per cent; California, 417 per cent; Ohio, 500 per cent.

MILWAUKEE'S SHOW WAS MOST SUCCESSFUL EVER

Gate Receipts Larger Than at Any Previous Exhibition—42,000 Attendance Is 6,000 Greater Than in 1914

When Milwaukee's seventh annual show closed January 14, officials of the Milwaukee Automobile Dealers Association declared that it was the greatest financial success the promoters have ever experienced. An attendance of 42,000, compared with 36,000 at the 1914 show, resulted in bigger gate receipts than ever before, while the number of exhibitors showed an increase, resulting in larger receipts for show space. The showing is exceptional because of the fact that the Milwaukee show is in many ways like a theatrical attraction and theaters in Milwaukee had had good reason to complain about their reduced receipts for many months.

The attendance on Tuesday, January 12, was estimated at 12,400. It was "State day" and several important meetings of state associations of dealers and owners were held, which accounts for the remarkable crowd on hand. On Tuesday night the Milwaukee Automobile Dealers Association entertained the state dealers at a banquet in the Schlitz Hotel and palm garden, at which more than 800 persons were present. As in past years, the Milwaukee show attracted a large number of tradesmen from Michigan avenue, Chicago, and the various factories in Detroit, Indianapolis and other cities.

Next year's show will be a double-decked affair, the Auditorium board having decided to spend \$12,000 in building a portable steel balcony around the main arena for display purposes. This space will be devoted to cars and accessories.

No figures are available to show wholesale and retail sales at the show, but interviews with dealers at random indicate a sale at least equal to that of previous years. Truck men declare they did a much larger business than a year ago, especially in the light delivery car field.

Haessly Heads Wisconsin Dealers

At the annual meeting of the Wisconsin Retail Automobile Dealers Association, held in Milwaukee during the seventh annual show, the following officers were elected: President, Nathan N. Haessly, Theresa; vice-president, L. F. Schoelkopf, Madison; secretary and treasurer, H. A. Apple, Milwaukee; di-

rectors, E. W. Clark, Fond du Lac; H. E. Zastrow, Portage; O. A. Kalvestran, Gays Mills; Rudolph Hokanson, Madison. The association plans a strong legislative fight during the present session of the Wisconsin legislature and will resist particularly the proposal to increase the annual license fee for motor car dealers from \$10 to \$25.

NEW YORK DEALERS HIT AT 50-FOOT RULE

A hearing is to be held in New York city at 2:30 this afternoon by the Board of Hazardous Trades before which the Automobile Dealers Association will protest against the 50-foot rule. This rule specifies that no garage shall be located within 50 feet of a school, hospital or other public building. The rule has been enforced in certain instances and has worked hardship upon garagemen and if enforced with rigidity would compel several of them to go out of business entirely. The dealers have had the matter under consideration for some time and have only now succeeded in getting a hearing. It will be in the Fire Department Headquarters in the Municipal building.

Fort Wayne Dealers Organize

Fifteen of the 19 dealers in Fort Wayne, Ind., have organized the Automobile Trade Association of Fort Wayne and one of the first subjects to be given consideration will be legislation. The officers are: President, A. L. Randall, Randall Auto Sales Co.; secretary, Louis Ohnhaus; treasurer, Louis Brase; committee on by-laws, Fred Gaskins, Lee Heller, James Porter and George Fox.

Embargo on Canadian Wares

An order-in-council has been passed forbidding export from Canada to any country other than part of the British empire of rubber and graphite. This action has been taken to prevent supplies of the commodities reaching Germany. Canada imports \$4,000,000 worth of rubber each year and exports about \$500,000 worth.

M. P. M. Car to Enter Field

The Mt. Pleasant Motor Co. has been organized in Mt. Pleasant, Mich., to build a car styled the M. P. M. N. J. Brown is president; H. A. Sanford, vice-president; W. A. Keen, secretary, and Mayor Deuel, of Mt. Pleasant, treasurer. The designer of the car is L. J. Lampke. For the present a touring car only will be made but later a runabout will be added.

ENGLAND AGREES TO LET RUBBER TRADING RESUME

Giving of Guarantee Settles Vexing Question—Some Shipments Arrive —Goodyear Stocked for Emergency

Permission has been granted by the English government to the United States Rubber Co. to resume the shipments of plantation grades of crude rubber from London to New York city at an early date, the necessary bond having been filed and other requirements in connection with the terms for lifting the embargo having been complied with.

Receivers of crude rubber in Para and Manaos have arranged with the Federal government for a loan, with rubber as collateral. An original deposit of \$915,000 had been made with the Bank of Brazil. The plan calls for further deposits, but the cables state that as the terms are indefinite the holders of rubber are already becoming nervous and are inviting bids for their supplies.

This action, it is explained, was taken with a view to sustaining the price of the Brazilian product against the time that the embargo on plantation grades would be lifted by the English government. Recently a steamer from Brazil discharged a cargo of 1,300 tons of crude rubber in New York.

Another steamer was due January 16, which has 1,100 tons on board, and still another left Para January 13 with 531 tons, which amount it is expected will be increased to at least 1,000 tons at Manaos.

The Goodyear Tire & Rubber Co., Akron, O., which was not inconvenienced by the embargo, having anticipated possible disturbances owing to the war by carrying larger stocks than usual, states that the factory production for November was 20 per cent greater than November, 1913, and the factory production for December was 33 per cent greater than in December, 1913. During the embargo rubber has been coming into Canada and being stored in Toronto. The company states it has more than 1,000 tons of crude plantation rubber in storage in that city.

Overland to Add Building

The Willys-Overland Co., Toledo, has awarded the contract for the erection of a new three-story concrete, brick and steel building. It will be 1,000 feet long and 200 feet wide.

MOTOR WORLD GUIDE

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT											
K	4-4½x5½	Spdfr	Zenith	A-Lite	Diak	3	116	34x4	1,785	.....	.....
L	4-4½x5½	Spdfr	Zenith	A-Lite	Diak	3	121	36x4½	2,085	.....	.....
F	6-3½x5½	Bosch	Zenith	A-Lite	Diak	4	130	35x4½	2,190	2,190	2,290
H	8-3½x4½	Battery	Zenith	Remy	Diak	4	116	34x4	1,685	.....	.....
ALLEN											
34	4-3½x5	Walth	Stmbg	Walth	Cone	3	110	32x3½	895	895	.....
ALTER											
4-27	4-3½x4½	Remy	Holley	Remy	Diak	3	106	30x3½	685	685	.....
APPERSON											
4-40	4-4 x5	.....	.....	.....	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	.....	.....	.....	Band	3	120	36x4	1,685	1,685	.....
6-60	6-4½x5	.....	.....	.....	Band	3	120	36x4	2,200	2,250	2,350
6-45	6-3½x5½	.....	.....	.....	Band	3	122	34x4	1,485	.....	.....
ARBENZ											
1915	4-4½x5½	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,835	.....
ARGO											
Argo	4-2 5-16x4	A. Kent	Argo	.....	Cone	2	90	28x2½	295	.....	.....
AURURN											
4-36	4-3½x5	.....	Rafld	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	.....	Rafld	.....	Cone	3	126	34x4	1,550	.....	.....
6-47	6-8½x5½	Bosch	Rafld	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN											
66	6-4½x5	Walth	Master	Walth	Diak	6	141	34x4½	3,600	3,600	3,600
BAUER											
R	4-4½x5	Mea	Shblr	Emrsn	Diak	3	110	34x3½	875	1,000	.....
BRISCOE											
B	4-3½x5½	Spdfr	.....	Apico	Cone	3	107	30x3½	785	785	.....
BUICK											
C-24-5	4-3½x3½	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	Delco	Marvel	Delco	Cone	3	130	36x4½	1,650	.....	1,650
CADILLAC											
51	8-3½x5½	Delco	Own	Delco	Diak	3	122	36x4½	1,975	1,975	1,975
CARTERCAR											
9	4-3½x5	Delco	Shblr	Delco	.....	106	33x4	.....	1,250	.....	.....
CASE											
35	4-4½x5½	Bosch	Rafld	Walth	Diak	3	120	35x4½	1,800	.....	.....
40	4-4½x5½	Bosch	Rafld	Walth	Diak	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	Walth	Stmbg	Walth	Diak	3	115½	34x4	1,350	.....	.....
CHADWICK											
19	6-5 x6	Bosch	Own	Walth	Band	4	.....	37x5r	5,500	5,500	5,500
CHALMERS											
26-R	6-3½x5½	A. Kent	Rafld	Entz	Diak	3	125½	34x4½	1,850	1,725	.....
M-6	6-4 x5½	Bosch	Rafld	Entz	Diak	4	132	36x4½	2,400	2,400	.....
32	6-3½x5	A. Kent	Rafld	G & D	Diak	3	120	34x4	1,400	.....	.....
CHANDLER											
15	6-3½x5	Bosch	Rafld	G & D	Diak	3	120	34x4	1,585	.....	.....
CHEVROLET											
H-4	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	.....	875	.....
H-2	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE											
4-40	4-4½x5½	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,865
6-51	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	Delco	Stmbg	Delco	Cone	3	138	37x5	2,465	2,465	2,465
CRAWFORD											
6-35	6-3½x5	Walth	Stmbg	Walth	Diak	3	120	34x4	1,850	1,850	.....
CROW											
E-42	4-4 x5	G & D	Shblr	Emrsn	Diak	3	114	33x4	1,150	1,165	.....
E-52	4-4½x5½	G & D	Shblr	Emrsn	Diak	3	120	34x4	1,475	1,600	.....
E-62	6-3½x5½	G & D	Shblr	Emrsn	Diak	3	130	36x4	1,895	1,895	.....
C.E.Jr	4-3½x4½	Disco	Holley	Disco	Diak	3	104	30x3½	725	.....	.....
CUNNINGHAM											
S	4-4½x5½	Undec	Stmbg	Undec	Diak	3	129	37x5	.....	.....	3,750
CYCLEPLANE											
Tour	4-2½x4	A. Kent	Own	.....	Diak	3	108	28x3	350	.....	.....
Trav	2-3½x4	A. Kent	Shblr	.....	.....	2	96	28x2½	250	.....	.....
DAVIS											
38-A	4-3½x5	Walth	Stmbg	Walth	Cone	3	112	34x4	1,235	1,235	.....
6-D	6-3½x5½	Bosch	Stmbg	G & D	Diak	4	128	37x4½	2,185	.....	.....
DETROITER											
C	4-3½x5	Remy	Stmbg	Remy	Diak	3	112	32x3½	.....	985	.....
DILE											
A	4-2½x4	Bring	Holley	.....	Diak	3	96	28x3	485	.....	.....

ABBREVIATIONS—"G & D" Gray & Davis, "Spdfr" Spltdorf, "A-Lite" Auto-Lite, "Walth" Westinghouse, "Shblr" Schbler, "Eismn" Eismann, "Rafld" Rayfield, "A. Kent" Atwater Kent, "Emrsn" Emerson, "Sevan" Severson, "Undec" Undecided, "Bring" Berling, "Kngstn" Kingston, "Natnl" National, "W.Lrd" Ward Leonard, "Brze" Breeze, "U.S.L." United States Lighting, "Conn" Connecticut, "Brigs" Briggs, "Stwrt" Stewart, "Crrr"

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
DODGE											
...	4-3½x4½	Eismn	Own	N E	Cone	3	110	32x3½	....	795	....
DORRIS											
1A-4	4-4½x5	Wsths	Stmbg	Wsths	Diak	3	121	36x4½	....	2,300	2,250
DORT											
Four	4-3 x4	Conn	.....	.....	Cone	3	...	30x3	495	....	.....
Five	4-3½x5	Conn	.....	.....	Cone	3	...	30x3½	....	680	.....
EMPIRE											
31-40	4-3½x4½	Remy	Holley	Remy	Disk	3	108	32x3½	975	975	....
ENGER											
6-50	6-3½x5	A. Kent	Rafld	G & D	Diak	3	125	34x4	1,495	....	1,495
FIAT											
55	4-130x170	Bosch	Own	Wsths	Diak	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	Bosch	Own	Wsths	Diak	4	135	37x5r	5,150	5,150	5,150
54	4-110x150	Bosch	Own	Wsths	Diak	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS											
82-E	4-4½x5½	Spldf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	....
90-E	6-4½x5½	Conn	Rafld	G & D	Disk	3	132	36x4	....	2,500	2,650
FORD											
T	4-3½x4	Ford	Holley	.....	Diak	2	100	30x3	440	400	....
FRANKLIN											
6-30	6-3½x4	Eismn	Own	Dyneto	Diak	3	120	34x4½	2,150	2,150	....
F. R. P.											
45-B	4-4 3-5x6½	Bosch	Stwrt	Bosch	Cone	4	110	36x4	All bodies to order		
GLIDE											
30	4-3½x5	Wsths	Shblr	Wsths	Diak	3	114	32x4	1,195	1,195	....
GRANT											
M	4-2½x4	Swiss	Mayer	A-C	Cone	2	90	28x3	425	....	....
T	6-2½x4½	A. Kent	Mayer	A-C	Cone	3	106	30x3½	....	795	....
GREAT WESTERN											
A	4-4½x5½	Kngstn	Kngstn	G & D	Cone	3	117	36x4	1,710	1,710	....
B	4-3½x5½	Kngstn	Kngstn	Bosch	Cone	3	117	34x4	2,200	....	....
HAYNES											
30	6-3½x5	Remy	Rafld	L-N	Diak	3	121	34x4	1,485	1,485	....
31	6-4½x5½	Simms	Stmbg	L-N	Band	3	130	36x4½	....	2,350	....
32	6-3½x5	Remy	Rafld	L-N	Diak	3	127	35x4½	....	1,550	....
33	4-4½x5½	Simms	Stmbg	L-N	Band	3	118	34x4	....	1,980	....
HERFF-BROOKS											
4-40	4-4½x5	Bosch	Stmbg	Apico	Cone	3	118	34x4	1,190	1,190	....
6-50	6-4 x4½	Bosch	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	....
HERRESHOFF											
4-18	4-2½x3½	A. Kent	Ctrr	Dyneto	Cone	3	94	28x3	500	....	....
HUDSON											
6-40	6-3½x5	Delco	Zenlth	Delco	Diak	3	123½	34x4	1,550	....	1,550
6-54	6-4½x5½	Delco	Zenlth	Delco	Diak	4	135	36x4½	....	....	2,350
HUPMOBILE											
H	4-3½x5½	Bosch	Zenlth	Wsths	Diak	3	106	33x4	1,050	1,050	....
K	4-3½x5½	A. Kent	Zenlth	Wsths	Diak	3	119	34x4	1,300	1,300	1,225
IMPERIAL											
64	4-3½x5	A. Kent	Stmbg	G & D	Diak	3	115	32x3½	....	1,085	....
56	6-3½x5½	Spldf	Stmbg	N E	Disk	3	130	36x4½	....	....	2,200
INTER-STATE											
T	4-3½x5	Remy	Shblr	Remy	Cone	3	110	33x4	....	1,000	....
JACKSON											
46	4-4½x5½	Remy	Shblr	A-Lite	Cone	3	117	34x4	1,375	1,375	....
48-6	6-3½x5	Delco	Stmbg	Delco	Cone	3	125	34x4½	....	1,650	....
JEFFERY											
Four	4-3½x5½	Bosch	Rafld	U S L	Cone	4	116	34x4	1,535	1,450	....
Six	6-3½x5½	Bosch	Rafld	U S L	Diak	4	133½	34x4½	....	....	2,400
Chfld	6-3 x5	Bosch	Stmbg	Bijur	Disk	4	123	34x4	1,650	1,650	....
KEARNS											
L	4-2½x4	Brng	Zenlth	A-C	Cone	3	100	28x3	450	....	....
KING											
...	4-3 15-18x5	A. Kent	Stmbg	W. Lurd	Disk	3	113	33x4	1,075	1,075	....
...	8-2½x5	A. Kent	Zenlth	W. Lurd	Disk	3	113	33x4	....	1,350	....
KISSEL											
4-36	4-4½x5½	Wsths	Stmbg	Own	Cone	3	121	34x4	1,450	1,450	1,550
6-42	6-3½x5½	Wsths	Stmbg	Kissel	Cone	3	126	34x4	1,650	1,650	1,850
6-48	6-4 x5½	Mea	Rafld	Kissel	Cone	4	132½	36x4½	2,350	2,350	2,550
6-60	6-4½x5½	Bosch	Rafld	Kissel	Cone	4	142	37x5	3,150	3,150	3,150
KLINE											
6-42	6-3½x5½	Wsths	.....	Wsths	Diak	3	123	34x4	1,750	1,750	....
6-42A	6-3½x5½	Wsths	.....	Wsths	Disk	3	127	36x4½	....	....	1,850
KRIT											
O	4-3½x4	Disco	Johnsn	Disco	Disk	3	108	32x3½	850	850	....
M	4-3½x4	Bosch	Stmbg	N E	Disk	3	108	32x3½	985	985	....

Model	Motor	Ignition	Carbureter	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
LAMBERT											
48-C	4-3/4x4	Briggs	Shblr	Briggs	.....	112	32x3 1/2	.....	1,200	.....	.....
68-C	4-4 1/2x5 1/2	Briggs	Shblr	Briggs	.....	117	34x3 1/2	.....	1,565	1,565	.....
LENOX											
Four	4-4 1/2x5 1/2	Waltha	Own	Waltha	Cone	3	118	34x4 1/2	.....	2,000	.....
Six	6-3 1/2x5 1/2	Waltha	Own	Waltha	Cone	3	130	34x4 1/2	.....	2,465	.....
LEWIS											
...	6-3 1/2x6	Briggs	Stmbg	Remy	Disk	3	135	36x4	1,600	1,600	.....
LEXINGTON											
Four	4-3 1/2x5 1/2	Waltha	Shblr	Waltha	Disk	3	115	34x4	1,375	1,375	.....
6-L	6-3 1/2x5	Waltha	Shblr	Waltha	Disk	3	128	34x4	1,875	1,875	.....
6-M	6-4 1/2x5	A. Kent	Stmbg	Jesco	Cone	3	130	36x4 1/2	2,575	2,575	2,675
LOCOMOBILE											
M-5	6-4 1/2x5 1/2	Bosch	Own	Waltha	Disk	4	140	37x5	5,100	.....	5,100
R-5	6-4 1/2x5	Bosch	Own	Waltha	Disk	4	132	37x5 1/2	4,400	4,400	.....
LUVERNE											
700	6-4 x5	Bosch	Shblr	Jesco	Disk	3	128	36x4 1/2	.....	.....	2,500
LYONS-KNIGHT											
K-4	4-4 1/2x5 1/2	Simms	Stmbg	N E	Disk	3	130	37x5	.....	2,900	2,980
MARMON											
41	6-4 1/2x5 1/2	Bosch	Stmbg	Bosch	Cone	3	132 1/2	36x4 1/2	3,250	3,250	3,350
48	6-4 1/2x6	Bosch	Zenith	Jesco	Disk	3	145	37x5 1/2	.....	.....	5,000
MAXWELL											
25	4-3 1/2x4 1/2	Simms	Kingstn	Simms	Cone	3	103	30x3 1/2	725	750	.....
McFARLAN											
T	6-4 x6	Waltha	Stmbg	Waltha	Cone	3	132	36x4 1/2	2,590	2,590	2,590
X	6-4 1/2x6	Waltha	Stmbg	Waltha	Cone	3	132	36x4 1/2	2,900	2,900	2,900
McINTYRE											
25	4-3 1/2x5 1/2	Bosch	Stmbg	G & D	Cone	3	106	32x3 1/2	.....	850	.....
6-40	6-3 1/2x4 1/2	Briggs	Stmbg	Briggs	Disk	3	120	35x4	.....	1,275	.....
MERCER											
Spdstr	4-3 1/2x6 1/2	Bosch	Zenith	U.S.L.	Disk	4	130	34x4 1/2	2,750	.....	.....
Rdstr	4-3 1/2x6 1/2	Bosch	Zenith	U.S.L.	Disk	4	130	34x4 1/2	.....	3,000	.....
METEOR											
42	4-4 x5	A. Kent	Stmbg	Spdfr	Disk	3	114	34x4	.....	1,075	.....
45	6-3 1/2x5	A. Kent	Stmbg	Spdfr	Disk	3	126	35x4	.....	1,395	.....
METZ											
22	4-3 1/2x4	Bosch	Own	G & D	.....	96	30x3	485	.....	.....	.....
25	4-3 1/2x4	.....	A.W.T.	G & D	.....	105	32x3 1/2	.....	600	.....	.....
MITCHELL											
Four	4-4 x5 1/2	Conn	.....	Spdfr	Cone	3	116	34x4	1,250	1,350	.....
Six	6-4 x5 1/2	Conn	.....	Spdfr	Cone	3	128	36x4	1,585	1,585	.....
7-6	6-4 1/2x7	Remy	.....	Remy	Cone	3	144	37x5	.....	2,350	.....
5-6	6-4 1/2x6	Remy	.....	Remy	Cone	3	132	36x4 1/2	1,895	1,895	.....
MOLINE-KNIGHT											
...	4-4 x6	Bosch	Shblr	Wgner	Cone	4	128	36x4 1/2	2,500	2,500	2,500
MONARCH											
Six	6-3 1/2x5	A. Kent	Zenith	W. Lrdr	Cone	3	125	33x4	.....	1,250	1,275
MONROE											
M-2	4-3 x3 1/2	Conn	Zenith	A-Lite	Cone	3	96	30x3	400	.....	.....
MOON											
4-38	4-3 1/2x5	Delco	Rafid	Delco	Disk	3	122	34x4	1,350	1,350	.....
6-40	6-3 1/2x5	Delco	Rafid	Delco	Disk	3	122	34x4	1,575	.....	.....
6-50	6-3 1/2x5 1/2	Delco	Rafid	Delco	Disk	4	130	35x4 1/2	2,150	.....	.....
MORSE											
D	4-4 1/2x5	Elsmn	Stmbg	G & D	Disk	4	127	36x4 1/2	3,000	3,000	3,000
NATIONAL											
AB	6-3 1/2x5 1/2	Elsmn	Rafid	Waltha	Cone	3	131	36x4 1/2	2,375	2,375	.....
NORWALK											
F	6-3 1/2x5 1/2	A. Kent	Rafid	G & D	Disk	4	131	37x4	1,875	.....	.....
OAKLAND											
37	4-3 1/2x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,150	1,200	.....
49	6-3 1/2x5	Delco	Johnson	Delco	Cone	3	123 1/2	35x4 1/2	.....	1,685	.....
Spdstr	4-3 1/2x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,100	.....	.....
OLDSMOBILE											
42	4-3 1/2x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,285	1,285	.....
55	6-4 1/2x5 1/2	Delco	Marvel	Delco	Cone	3	130	36x5	.....	2,975	.....
OVERLAND											
90	4-4 1/2x4 1/2	Bosch	Shblr	A-Lite	Cone	3	114	34x4	1,050	1,075	.....
81	4-4 x4 1/2	Spdfr	Shblr	A-Lite	Cone	3	106	33x4	795	850	.....
82	6-3 1/2x5 1/2	Bosch	Shblr	A-Lite	Cone	3	125	35x4 1/2	.....	1,475	.....
OWEN											
...	6-3 1/2x5 1/2	Owen	Master	O.M.	O.M.	136	35x5	3,750	.....	3,750	.....
PACKARD											
3-38	6-4 x5 1/2	Bosch	Own	Bljur	Plate	3	140	37x5 1/2	3,750	3,750	3,850
3-48	6-4 1/2x5 1/2	Bosch	Own	Bljur	Plate	3	144	37x5	4,750	4,750	4,850
PAIGE											
81x	6-3 1/2x5 1/2	Bosch	Rafid	G & D	Disk	3	124	34x4	1,395	.....	1,895
36	4-4 x5	Bosch	Stwrt	G & D	Disk	3	116	34x4	1,075	1,075	.....
PARTIN-PALMER											
20	4-3 1/2x4	A. Kent	Mulr	G & D	Disk	3	96	28x3	495	.....	.....
38	4-3 1/2x5 1/2	A. Kent	Stmbg	G & D	Cone	3	115	33x4	.....	.....	.....
PATERSON											
4-32	4-3 1/2x5	Delco	Stmbg	Delco	Cone	3	112	33x4	.....	1,095	.....
6-48	6-3 1/2x5	Delco	Stmbg	Delco	Cone	3	124	34x4	.....	1,495	.....
PATHFINDER											
...	6-3 1/2x5 1/2	Waltha	Shblr	Waltha	Disk	4	125	34x4 1/2	2,222	.....	2,322
PEERLESS											
54	4-3 1/2x5	A. Kent	Stmbg	G & D	Disk	3	113	34x4	2,000	2,000	.....
55	6-5 1/2x5	A. Kent	Stmbg	G & D	Disk	3	121	34x4	2,250	2,250	.....
68-6	6-4 1/2x6	Bosch	Own	G & D	Band	4	157	37x5	4,900	.....	5,000

Model	Motor	Ignition	Carbureter	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PETER PAN											
3-E	4-2 1/2x4 1/2	Brng	.....	.....	Disk	3	110	28x3 1/2	650	....	....
PIERCE-ARROW											
C-3	6-4 x5 1/2	Bosch	Own	Wths	Cone	4	134	36x4 1/2	4,300	4,300	....
H-3	6-4 1/2x5 1/2	Bosch	Own	Wths	Cone	4	142	37x5	4,900	4,900	5,000
A-3	6-5 x7	Bosch	Own	Wths	Cone	4	147 1/2	38x5 1/2	5,900	5,900	6,000
PILOT											
55	6-3 1/2x5 1/2	Wths	Shblr	Wths	Cone	3	126	34x4	1,885	1,885	1,985
75	6-4 1/2x6	Wths	Ctrr	Wths	Cone	3	132	37x4 1/2	2,885	2,885	2,885
PREMIER											
A	6-3 1/2x5 1/2	Elsmn	Rafld	Remy	Disk	3	132	36x4 1/2	2,700	2,700	2,750
PRATT											
6-30	6-3 1/2x5 1/2	A. Kent	Rafld	G & D	Disk	4	132	37x4 1/2	2,150	2,150	2,250
PULLMAN											
Jr	4-3 1/2x4 1/2	Spldf	Stmbg	Spldf	Diak	3	110	30x3 1/2	740	740	....
6-48	6-3 1/2x5 1/2	Simms	Stmbg	Wths	Disk	4	124	36x4 1/2	2,600	2,600	2,550
RAYFIELD											
20	4-2 1/2x4 1/2	.....	Own	.....	Disk	3	96	28x3	....	395	....
R-C-H											
K	4-3 1/2x5	Bosch	H-D	W. Lrdr	Cone	3	110	32x5 1/2	....	900	....
REGAL											
D	4-3 1/2x5	A. Kent	Stwrt	Bosch	Cone	3	112	32x4	1,085	1,085	....
REMINGTON											
...	4-3 1/2x4	A. Kent	.....	W. Lrdr	Cone	3	106	30x3 1/2	695	695	....
REPUBLIC											
E	6-4 1/2x5	Delco	Rafld	Delco	Cone	4	133	36x4 1/2	....	2,950	3,000
REO											
M	6-3 9-16x5 1/2	Remy	Johnn	Remy	Diak	3	122	34x4	....	1,385	....
ST	4-4 1/2x4 1/2	Natnl	Holley	Natnl	Disk	3	112	34x4	1,000	....	....
R	4-4 1/2x4 1/2	Remy	Holley	Remy	Disk	3	115	34x4	....	1,050	....
SAXON											
A	4-2 1/2x4	A. Kent	Mayer	.....	Plate	2	96	28x3	895	....	....
B2	6-2 1/2x4 1/2	A. Kent	.....	G & D	Disk	3	112	32x3 1/2	....	785	....
SCRIPPS-ROOTH											
C	4-2 1/2x4	A. Kent	Zenith	Bljur	Cone	3	110	30x3 1/2	775	....	....
SPAULDING											
H	4-4 1/2x5 1/2	Simms	Rafld	Entz	Cone	3	120	36x4	....	1,680	....
S. G. V.											
J	4-3 1/2x4 1/2	Bosch	Zenith	W. Lrdr	Diak	4	118	34x4	2,300	2,300	....
SIMPLEX											
38	4-4 1/2x6 1/2	Bosch	Nwcm	Bosch	Disk	4	137	37x5 1/2	All bodies to order		
50	4-5 1/2x6 1/2	Bosch	Nwcm	Bosch	Disk	4	137	37x5 1/2	All bodies to order		
SINGER											
Six	6-4 x5 1/2	Elsmn	C R G	Wths	Disk	4	135	36x4 1/2	2,350	2,350	....
SPEEDWELL											
I	6-4 1/2x5 1/2	Wths	Shblr	Wths	Diak	3	135	37x5	....	....	2,950
SPHINX											
A-15	4-3 1/2x5	Spldf	Mayer	Spldf	Cone	3	112	30x3 1/2	....	695	....
STEARNS											
L-4	4-3 1/2x5 1/2	Bosch	Shblr	G & D	Cone	3	119	34x4	1,750	1,750	....
S-K-4	4-4 1/2x5 1/2	Bosch	Stmbg	G & D	Disk	3	127	36x4 1/2	3,750	3,750	2,900
S-K-6	6-4 1/2x5 1/2	Bosch	Stmbg	G & D	Disk	4	134	37x5	4,950	4,950	5,000
STUDEBAKER											
4-SD	4-3 1/2x5	Remy	Shblr	Wagner	Cone	3	106	33x4	985	985	....
6-E.C.	6-3 1/2x5	Remy	Shblr	Wagner	Cone	3	121	34x4	....	1,385	1,450
STUTZ											
H.C.S	4-3 1/2x5	Remy	Stmbg	Remy	Cone	3	108	32x4	1,475	....	....
Hr. Cat	4-4 1/2x5 1/2	Bosch	Stmbg	Remy	Cone	3	120	34x4 1/2	2,000	....	....
Six	6-4 x5	Elsmn	Stmbg	Remy	Cone	3	120	34x4 1/2	2,125	....	....
T. Car	4-4 1/2x5 1/2	Bosch	Stmbg	Remy	Cone	3	130	34x4 1/2	....	2,275	....
T. Car	6-4 x5	Elsmn	Stmbg	Remy	Cone	3	130	34x4 1/2	....	2,400	....
TOURAINÉ											
12	6-4 x5 1/2	Simms	Zenith	Wths	Disk	4	124	34x4 1/2	3,150	3,150	3,250
TRUMBULL											
15-AB	4-2 1/2x4	Spldf	Brze	W. Lrdr	Cone	3	80	28x3	395	....	....
TWOMBLY											
...	4-3 1/2x4	Spldf	Zephyr	Undec	Cone	3	100	30x3	600	750	....
VELIE											
4-45	4-4 1/2x5 1/2	Bosch	Stmbg	G & D	Diak	4	121	37x4 1/2	1,750	1,750	....
6-50	6-5 1/2x5 1/2	Bosch	Stmbg	G & D	Disk	4	126	37x4 1/2	2,015	2,015	....
Bltwt	6-5 1/2x5	A. Kent	Stmbg	G & D	Disk	4	124	34x4	1,595	1,595	....
VIXEN											
S.B	4-2 1/2x4	A. Kent	Zephyr	.....	.....	.....	106	28x3	395	....	....
VULCAN											
...	4-3 1/2x5 1/2	Wths	.....	Wths	Disk	3	120	32x3 1/2	975	975	....
WESTCOTT											
O	4-3 1/2x5	Delco	.....	Delco	Cone	3	113	33x4	1,150	1,150	....
U	6-3 1/2x5	Delco	.....	Delco	Cone	3	125	34x4	....	1,585	....
WHITE											
30	4-3 1/2x5 1/2	Bosch	Own	Own	Plate	4	115	32x4	2,650	2,700	....
45	4-4 1/2x6 1/2	Bosch	Own	Own	Plate	4	122 1/2	36x4 1/2	....	....	2,800
60	6-4 1/2x5 1/2	Bosch	Own	Own	Plate	4	140 1/2	37x5	All bodies to order		
WILLIS-KNIGHT											
K-19	4-4 x5 1/2	Simms	Zenith	U.S.L	Cone	4	129	36x4 1/2	....	2,475	....
WINTON											
21	6-4 1/2x5 1/2	Bosch	Rafld	Air or Elec	Disk	4	136	37x5	3,250	3,250	2,500
21A	6-3 1/2x5 1/2	Bosch	Rafld	Air or Elec	Disk	4	126	36x4 1/2	3,250	3,250	2,500

The Week's INCORPORATIONS

Grand Rapids, Mich.—Grand Rapids Saxon Co.; \$5,000; dealer.

Cedar Rapids, Ia.—L-Ty-To Co.; \$10,000; manufacturer tire trouble remedy.

Minneapolis, Minn.—Shotwell-Harris Co.; changed to Shotwell-Hobart-Johnson Co.

Manitowoc, Wis.—Dicke Taxicab Co.; \$1,000; W. C. and L. S. Dicke and Hugo Menzel.

Sapulpa, Okla.—Sapulpa Gasoline and Oil Co.; \$15,000; dealer. P. E. Smith, L. E. Smith, P. F. Smith.

Houston, Tex.—Magnolia Motor Sales Corp.; \$12,000; dealer. J. D. Kerr, P. H. Carr, G. E. Gilmore.

American Falls, Id.—American Falls Auto Co.; \$25,000; garage. Benjamin Adof, A. W. Davis, J. L. McKown.

Wakita, Okla.—Clinesmith Motor Co.; \$5,000. dealer. F. L. Clinesmith, John Clinesmith, William Clinesmith.

Eureka Springs, Ark.—Auto Service & Supply Co.; \$14,000; dealer. F. B. and B. M. Stowe, J. A. and E. E. Monagan.

El Paso, Tex.—Motor Bus Co.; \$2,500; operator line of motor buses. J. V. Robins, J. J. McCourt, J. W. Kirkpatrick.

Detroit, Mich.—American Motor Sales Co.; \$6,000; dealer. J. C. Pennell, Hanley Dawson, E. E. Sullivan, B. C. Pennell.

Edgewater Park, N. J.—Edge Auto Devices Co.; \$25,000; accessory manufacturer. M. B. Earl, B. W. Earl, F. H. Munch.

Bucyrus, O.—Alter Motor Sales Co.; \$10,000; dealer. L. D. Pickering, W. H. Drause, D. Kissling, Emma Pickering, M. S. Drause.

Louisville, Ky.—Grant Mfg. Co.; \$9,000; chemical manufacturer and automobile specialties. A. C. Grant, R. E. Simms, J. L. Lenihan.

Cleveland, O.—Gholson Auto Co.; \$10,000; dealer. K. M. Gholson, W. F. Gholson, A. N. Meyer, Esther Hayes, J. G. Murphy.

Chillicothe, Mo.—Adams Automobile & Supply Co.; \$25,000; dealer. C. F. Adams, R. F. Adams, C. A. Adams, T. J. Grothe, A. J. Cole.

Columbus, O.—Kissel Service Co.; \$10,000; dealer. C. G. McCune, R. T. Fisher, William Gaither, J. M. Garard, L. B. Dunning.

Cleveland, O.—F. J. Erney Mfg. Co.; \$3,000; lamp manufacturer. J. H. Folk, Jr., A. J. Kasch, J. F. Pavolik, F. J. Erney, A. A. Lutton.

New York City—Dals Auto Supply & Accessory Co.; \$25,000; manufacturer motors, appliances, etc. B. Schane, A. L. Schane, D. L. Schane.

Youngstown, O.—Motor Sales and Supply Co.; \$10,000; dealer. W. V. Burnett, D. L. Rose, A. C. Hendry, D. F. Griffith, R. C. Fuhrman.

Willoughby, O.—Standard Fuel Oil Co.; \$50,000; engine manufacturer. J. E. Morley, C. H. Gale, H. C. Jones, B. A. Kittinger, W. T. Kinder.

Carrollton, O.—Monarch Rubber Co.; \$1,000,000; tire manufacturer. E. S. Henderson, I. E. Friedler, H. E. Henderson, F. W. McCoy, H. R. Kemmer.

Muskogee, Okla.—Muskogee Automobile Dealers' Assn.; mutual capital stock. W. A. Campbell, C. L. Anderson, Harry Kitto, Henry Paterston, S. J. Miller.

Gagetown, Mich.—Mayers-Hoffman Co.; \$50,000; to manufacture contrivance invented by C. E. Meyers, 73 Rosedale court, which is claimed to be puncture proof.

Changes in Corporate Name.

Milwaukee, Wis.—Burgett Auto Co.; changed to Milwaukee Motor Sales Co.

Portland, Me.—Spear Auto Co.; to Peterson Motor Co.

Recent Losses by Fire

Pittsburgh — Cartney Bros., 111-15 Beatty street; damaged. Loss not stated.

Pittsburgh—Oakmont Motor & Boat Co., 5852-54 Baum boulevard; 9 cars destroyed; garage damaged. Loss, \$19,500.

Dealer Literature Received

Diamond State Fibre Co., Elsmere, Del.—Automobile number of company's bulletin, Diamond Fibre Products. Four pages, 7¼ x 10½; illustrated; has arguments for salesmen to use in campaign which is being launched in motor car industry.

Atterbury Motor Car Co., Buffalo, N. Y.—"Solving the Problem"; 8-page folder with 6 pictures of trucks in service; two colors; detachable return card acts as sealing tab.

Motor Car Securities Quotations

	Jan. 16, 1914	Jan. 16, 1915
	Bid Asked	Bid Asked
Ajax-Grieb Rubber Co., com.	105 88	100 100
Ajax-Grieb Rubber Co., pfd.	98 102	95 100
Aluminum Castings, pfd.	97 100	95 100
Chalmers Motor Co., com.	90 93	88 90
Chalmers Motor Co., pfd.	92 97	88 90
Firestone Tire & Rubber Co., com.	248 253	385 370
Firestone Tire & Rubber Co., pfd.	102 104	110 111
General Motors Co., com.	80 80	90 90
General Motors Co., pfd.	83 84	93 94
B. F. Goodrich Co., com.	21 22	31 32
B. F. Goodrich Co., pfd.	82 83	95 96
Goodyear Tire & Rubber Co., com.	216 258	183 185
Goodyear Tire & Rubber Co., pfd.	85 87	102 103
Gray & Davis, pfd.	90 90	90 90
International Motor Co., com.	15 15	15 15
International Motor Co., pfd.	15 15	15 15
Kelly-Springfield Tire Co., com.	45 47	74 79
Kelly-Springfield Tire Co., 1st pfd.	105 120	79 80
Kelly-Springfield Tire Co., 2nd pfd.	100 100	100 102
Lozier Motor Co., com.	15 15	15 15
Lozier Motor Co., pfd.	80 80	80 80
Maxwell Motor Co., com.	4 5	18 18
Maxwell Motor Co., 1st pfd.	20 30	53 54
Maxwell Motor Co., 2nd pfd.	8 9	21 22
Miller Rubber Co., com.	124 130	150 158
Packard Motor Car Co., com.	80 80	80 80
Packard Motor Car Co., pfd.	85 85	83 83
Peerless Motor Car Co., com.	15 15	15 15
Peerless Motor Car Co., pfd.	75 75	80 80
Pope Mfg. Co., com.	2 2	2 2
Pope Mfg. Co., pfd.	12 12	12 12
Portage Rubber Co., com.	40 40	25 30
Portage Rubber Co., pfd.	90 90	80 85
Reo Motor Truck Co., com.	8 8	7 11
Reo Motor Truck Co., pfd.	14 15	25 25
Stewart-Warner Spdr. Co., com.	30 32	33 33
Stewart-Warner Spdr. Co., pfd.	94 94	100 102
Studebaker Corp., com.	22 23	41 41
Studebaker Corp., pfd.	73 74	94 95
Swinehart Tire & Rubber Co., com.	69 71	69 71
U. S. Rubber Co., com.	58 59	55 57
U. S. Rubber, pfd.	103 104	102 103
Willis-Overland Co., com.	105 105	108 110
Willis-Overland Co., pfd.	88 88	88 88

Coming Events

Feb. 22, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Feb. 27, San Francisco, Cal.—Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

May 29, Indianapolis, Ind.—500-Mile Race, Indianapolis Motor Speedway.

THE SHOW CIRCUIT

Jan. 16-23, Cleveland, O.—Automobile show, Wigmore Coliseum, Cleveland Automobile Show Co.

Jan. 16-23, Detroit, Mich.—Automobile show, Detroit Automobile Dealers' Association.

Jan. 19-23, Baltimore, Md.—Automobile show, Fifth Regiment Armory. Baltimore Automobile Dealers' Association and Automobile Club of Maryland.

Jan. 25, Boston, Mass.—Banquet, American House, Boston Automobile Accessory Dealers Association.

Jan. 23-30, Chicago, Ill.—Automobile Show, First Regiment Armory and Coliseum.

Jan. 23-30, Montreal, Can.—Automobile show, Allen Line Liverpool Buildings. Montreal Automobile Trade Association.

Jan. 25-30, Buffalo, N. Y.—Buffalo Automobile Dealers Association's annual show.

Jan. 30 to Feb. 6, Minneapolis, Minn.—Automobile show, National Guard Armory.

Feb. 1-6, Scranton, Pa.—Automobile show, Town Hall. H. B. Andrews, manager.

Feb. 2-6, Kalamazoo, Mich.—Show; Armory, Harry B. Parker and John Van Loon, managers.

Feb. 3 to 6, St. Joseph, Mo.—Automobile show, Auditorium. St. Joseph Automobile Show Association.

Feb. 4-6, Marinette, Mich.—Menominee and Marinette dealers; Armory.

Feb. 8-13, Toledo, O.—Toledo Auto Shows Co., Terminal building; Hugo V. Buelow, manager.

Feb. 8-14, Kansas City, Mo.—Automobile show, Convention Hall.

Feb. 15-20, Tacoma, Wash.—Show; A. L. Sommers, managers.

Feb. 15-20, Grand Rapids, Mich.—Automobile show, Klingman Furniture Exposition Building.

Feb. 15-20, Bridgeport, Conn.—Show; Armory.

Feb. 15-20, Omaha, Neb.—Show, Auditorium. C. G. Powell.

Feb. 23-27, Ft. Dodge, Ia.—Automobile show, Armory.

Feb. 23-27, Syracuse, N. Y.—Automobile show, State Armory, Syracuse Automobile Dealers' Association.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

March 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 4

New York, January 27, 1915

Ten cents a copy
Two dollars a year

PIERCE-ARROW

The mind of the owner of a Pierce-Arrow does not run on ahead of him in vain speculation as to whether the car will be on time, or will get him there on time. He soon sinks into a feeling of trustfulness in regard to his Pierce-Arrow. He need never interrupt his plans, break an engagement, allow greater time for going to and fro, or omit doing anything that counts upon the faithful efficiency of a Pierce-Arrow.

THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO NEW YORK



Published Every Wednesday by The Motor World Publishing Company, 231-241 West 39th St., New York

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Dealers everywhere are selling DANN Insert at a record-smashing rate. They are making big money. There is no limit to sales. Every car owner **needs** DANN Insert. Every motorist in your town is a **live** prospect. There is nothing else on the market like DANN Insert. You meet with no competition.

DANN INSERT

"The Insert of 10,000 Oil Pockets"

You should install DANN Insert in every car you overhaul this spring. You make an extra profit on the work of installation.

DANN Insert is a thin, perforated strip of specially compounded metal, designed to be inserted from tip to tip between spring leaves. Perforations in the Insert are packed with a heavy lubricant which cannot squeeze out. DANN Insert is supplied ready-boxed in sets for any make of car.

Write for generous dealers' proposition. Insure yourself big profits.

DANN OIL-CUSHION **SPRINGS** **Lubricated Automatically-Guaranteed**

DANN Oil Cushion SPRINGS are a new addition to our line. They are springs furnished complete with DANN Insert ready installed between their leaves. Their success has been instantaneous. They were the sensation of the Automobile Shows.

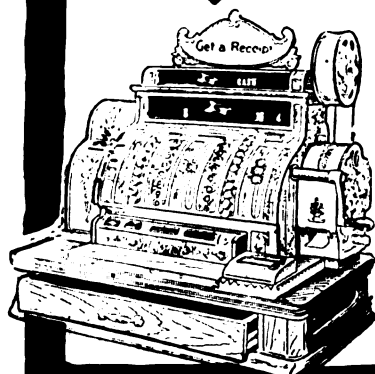
The only **thoroughly, permanently** lubricated springs obtainable. The strongest, highest-grade double heat-treated springs **plus** all the advantages of DANN Insert. Rust-proof, squeak-proof, possessing rare shock-absorbing qualities, automatically lubricated and **GUARANTEED**.

Supplied for all makes and models of cars. Lay in a stock now! Our nation-wide advertising campaign will bring you the bulk of the spring trade of your vicinity. Write for price list and generous dealers' proposition.

Dann Oil Cushion Spring Insert Co.

2265 Indiana Avenue

Chicago, Ill.



★ Hartford

SHOCK ABSORBER

Improved Automatic Model

It is Automatic in This:

There is no drag or thrust on the springs under normal conditions.

The Improved Automatic Hartford Shock Absorber operates progressively.

When rough roads cause the springs to oscillate beyond normal the Hartford absorbs and equalizes more and more of the spring action.

So sensitive and accurate is this spring control that you in the car can detect little difference between boulevard and roughest country road.

Vibration and resultant crystallization of metals is eliminated. Tires last longer. Up-keep is reduced. And your pleasure in motoring is vastly increased.

Send for information and booklet

Hartford Suspension Co.

E. V. HARTFORD, President

142 Morgan St., Jersey City, N. J.

Branches and Distributors in Large Cities
Dealers Everywhere

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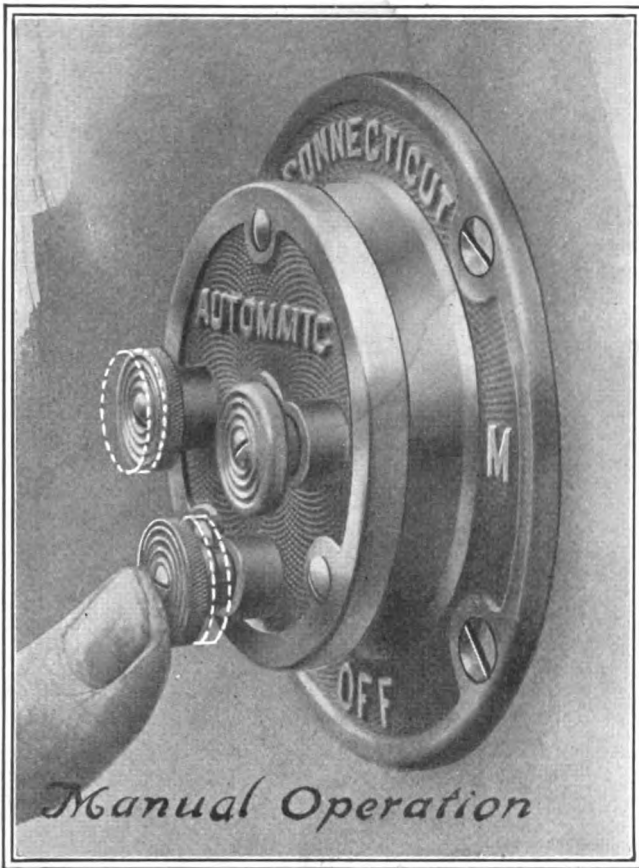
Prices—Four Models

No. 1. **Large Size**, for cars over 3,000 pounds, per set of four - - - - **\$60**

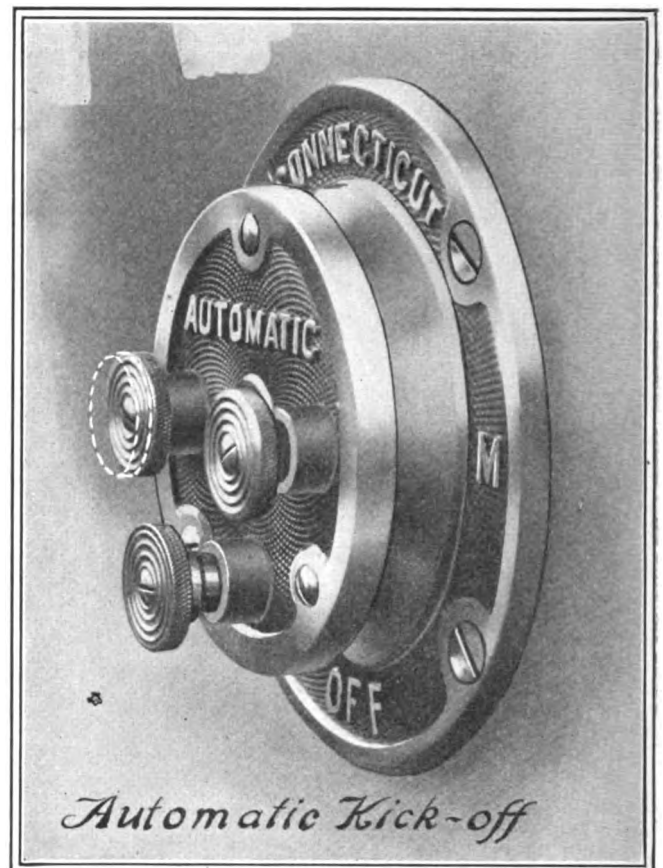
No. 2. **Medium Size**, for cars from 2,000 to 3,000 pounds, per set of four - **\$40**

No. 3. **Junior Size**, for cars under 2,000 pounds, per set of four - - - - **\$25**

Special Ford Set - - \$16



Connecticut Automatic Switch may be operated by hand like any other control switch



Should the driver forget or neglect the ignition, the Switch kicks it off automatically

The Effectiveness of CONNECTICUT AUTOMATIC IGNITION is possible because of the Automatic Switch

The Automatic Switch is the keystone in the structure of Connecticut Automatic Ignition. It is a feature individual to this system and unique in ignition apparatus.

Any system of battery ignition, designed with a closed primary circuit, is superior to the magneto on low speeds. To maintain its superiority on high speeds such a system must be designed to secure thorough saturation of the coil.

In every case but one thorough saturation of the coil of a closed circuit system is attended by the danger of battery drainage, and this contingency has been a stumbling block to ignition manufacturers who have attempted to design similar systems.

This contingency is no menace whatever in CONNECTICUT AUTOMATIC IGNITION because of its AUTOMATIC SWITCH.

The function of the Connecticut Automatic Switch is to "kick off" the current should the primary circuit be closed for an unwarranted length of time, as when the driver upon stopping his engine forgets or neglects to switch off the ignition current.

The Automatic Switch also protects the ignition wiring should a disarrangement occur in the lighting or starting circuit.

The principle upon which the Connecticut Automatic Switch operates

is simple. The "kick off" is accomplished thermostatically by a mechanism which has been employed successfully for many years in Connecticut Telephone Switches.

The switch is no more complicated than an ordinary electric bell and will operate indefinitely without any attention whatever.

In all the years we have had the mechanism of this switch in use, it has never failed its purpose.

It is more than human—it never forgets.

CONNECTICUT TELEPHONE and ELECTRIC COMPANY, Inc., Meriden, Conn.

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Most punctures are unnecessary

Every experienced motorist knows that most punctures, so-called, are caused by faulty tubes rather than actual, accidental incision through the tire. Leakage around valves, porous rubber and worn spots are only a few of the unnecessary troubles common to cheap machine-made tubes.

The way to avoid needless punctures is to equip your car with tubes properly *made by hand out of real rubber*. *Kelly-Springfield Tubes* are made that way—and we make them slowly enough and in small enough quantity to *make them right*.

If you are tired of needless tube trouble, try them.

Kelly-Springfield Tires are made the same way. You get the result in increased mileage.

Send for "Documents in Evidence" which tells the experience of others



Kelly - Springfield Tire Company

Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.
The Southern Tire & Repair Co., Houston and Beaumont, Texas
Boger-Stiess Rubber Co., 1208 Hennepin Ave., Minneapolis, Minn.
The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.
The Olmsted Co., Inc., Syracuse, N. Y.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.
L. J. Barth, Rochester, N. Y.
Seifert & Baine, Newark, N. J.
Atkinson Tire & Supply Co., Jacksonville, Fla.
Central Rubber & Supply Co., Indianapolis, Ind.
C. D. Franke & Co., Charleston, S. C.
K. & S. Auto Tire Co., Limited, Toronto, Ont.
Todd Rubber Co., New Haven, Conn.
Barnard-Michael Tire Co., Buffalo, N. Y.



Business Better Than Ever

In spite of the general reports, about depressed business throughout the country during the past season, the Overland business has never shown such a steady and healthy increase.

In the twelve months ending December 31st, 1914, we delivered

48,468 cars

During the same period in 1913 we delivered

37,129 cars

Certainly this must clearly indicate which is the best car in the minds of the public.

Catalog on request. Please address Dept. 50

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, January 27, 1915

No. 4

Chicago Show Proves Greatest Dealer Magnet

Attendance Figures Will Go 50,000 Over 1914 Record—
Eights Still Continue To Hold The Center of The Stage

THE Chicago show—which is the greatest show from the dealer's standpoint—is being held this week. It opened Saturday afternoon with an attendance which indicates that the show will be one of the best ever staged from the gateman's point of view.

Prognostications as to the total are, of course, to some extent guesses, but Manager Samuel A. Miles, who is a show expert, estimates that the week will see 300,000 visitors at this big western exhibition. Last year the attendance was about 50,000 less than this.

More Dealers Than at New York

Dealers in any number did not attend the opening day, which is quite largely a "paper" day. The biggest days for dealers are Monday, Tuesday and today, and Manager Miles estimates that 3,500 will inspect the varied offerings at the show. This is about 25 per cent better than the New York dealer attendance, for the Chicago show always runs about that far ahead of the earlier exhibition.

At the show there are 302 exhibitors. Of these 79 display gasoline cars, 9 electrics, and the remaining 214 are listed in the accessory division. There are 9 cars which were not shown in New York and 9 which were shown in New York that have not put in an appearance at the western affair.

Eights constitute the principal newness at the show, supplemented by several new models of other types. Regal shows a new eight and a new small four;

MOTOR WORLD RESULTS

WOLFLEY AUTOMOBILE COMPANY
CHICAGO, ILL.
DECEMBER 21, 1914.

We feel that we are somewhat indebted to you for the article appearing in issue of December 9th regarding collections. We have started in on this system and out of something like 100 accounts on our books got in 18 settlements the first letter. This was mailed December 15th. On December 20, we mailed the second letter, and while it has been out only twenty-four hours at this writing we have had five responses, which shows the efficacy of the plan.

We feel that you are doing a good work, and in order to assist you are taking the paper for another year.

WOLFLEY AUTO CO.

By Jas. A. Wolfley.

Cole has a new eight; Imperial is displaying a new six; the new Buda motor makes its first appearance; the six-cylinder Ogren is an entirely new car; Franklin has disclosed a new series; the Halladay reappears with a new six; the Ross eight is added to the list; Moline-Knight has a new four; the Shaw is new, and there is the Davis eight.

The Franklin Automobile Co., which appeared at the New York show with its regular line, has presented a new series, style 7. The price for the touring car remains the same, \$2,150. The Chandler Motor Car Co. created somewhat of a sensation by announcing on the opening day of the show a cut of \$300 on the price of the touring car, bringing this model from \$1,595 to \$1,295.

Late Arrivals Cool Tires Outside

In the accessory classification the principal new development is a Westinghouse Ford system. This produces 12 volts for starting and lighting and with a battery and wiring, but no lamps, sells for \$75; with the addition of an ignition distributor the price is \$90.

Several of the exhibitors had trouble due to the failure of their exhibit shipments to arrive on time. The Mercer's car arrived at the door 30 minutes late and all Saturday afternoon the Mercer space was empty. Manager Miles granted a special dispensation and they were rolled in between 5 and 6 o'clock. The Scripps-Booth found themselves in a similar predicament.

Some Dealers Who Populate Chicago's Motor Show



Left to right—E. L. Cummins, salesmanager, Bird-Sykes Co. (Paige); B. G. Sykes, Bird-Sykes Co.; C. R. Dashiell, president, Dashiell Motor Co. (Dodge); M. J. Lanahan, Dashiell Motor Co.; James Levy, president, Chalmers Motor Co. of Illinois; Charles E. Gregory, general manager, Chalmers Motor Co. of Illinois

How the Chicago Dealer Makes Capital of the Show

Opinion Prevails That Little Good Comes From Giving Free Tickets

THE Chicago show, while it is attended by more dealers than any other show in America, is not a dealer show. It is staged by the National Automobile Chamber of Commerce, yet the Chicago dealers cooperate to a large extent in the staging of the affair. In their show work one point stands out with prominence; very few tickets are distributed to prospects.

On the opening day of the show passes are numerous. These are distributed in order that the many dealer employes and friends may view the exhibit and also that the attendance on the opening day may be large. The dealers, however, do not care to invite prospects with this sort of ticket, and inasmuch as tickets for admission on the other days are charged to the dealer at 50 cents each very few of them are used.

Passes Expensive and Useless

Dealers are permitted to buy tickets at 50 cents each and those that are not used may be returned, whereupon the money is refunded. The consensus of opinion among the Chicago dealers, however, is that there is little value derived from the distribution of these tickets.

It is stated that too often they do not remain in the hands of good prospects

OPTIMISM

THE spirit of optimism permeates the show. It was impossible to locate a single pessimist. When asked for a candid statement of facts those in touch with the situation stated that while November and December had been bad months the dark clouds were rolling away and that there are bright prospects of a thriving spring business.

In the Southwest, which was given a setback by the cotton situation, conditions are said to be much better with a marked pick-up in business. Corn in the Middle West commands a high price, and wheat, as any student of market reports knows, is at a record figure. In states such as Iowa, one territorial man stated there should be an abundance of money within the next three months.

In many quarters it is plainly apparent that the motor car dealers harbor resentment toward the bankers. While there may be a strong case for the bankers, the dealers are unable to see it, and contend that the attitude of the men who finance has been largely responsible for the shortage of money and the slow business.

Salesrooms Are Transformed to Carry Out Atmosphere of the Show

and that on the whole they constitute a very expensive and valueless advertising.

To the man who contemplates buying a car the privilege of inspecting all the cars on display is worth 50 cents, the dealers state, and they add that the majority of prospects would rather pay their own way into the show and not feel under obligations to any dealer.

Easy to Spend \$1,000 on Tickets

Inasmuch as the distribution of tickets is limited, many of the dealers do not even send invitations to their prospects. Some of them feel that to send an invitation and not enclose a ticket would be inconsistent. Others send letters telling what the exhibit at the show will include and leave it to the prospect to pay his own way in if he is sufficiently interested. One dealer stated that he could easily spend \$1,000 on tickets, and he added that this money would bring in a much better return if expended in advertising.

One reason for the general opinion on the question is the action of the Chicago Automobile Trade Association, the dealers' organization of the city. This association has placed itself on record as not in favor of a promiscuous

use of tickets and the majority of the members have taken that as their cue.

Members of the association state that this disapproval is based partly upon the fact that the organization does not make a profit on the show, as do the dealer associations in other cities throughout the country which promote the shows. In Philadelphia the promoting organization generally gets all its money back, and this year the Milwaukee show returned 95 per cent. This the Chicago men state justifies the use of tickets by dealers in those cities.

Most of the dealer work is done at the show and not in salesrooms this week. James Levy, of the Chalmers Motor Co., has transformed his salesroom into a Chinese garden, with low picket fences; the Willys-Overland dealer has erected two beautiful autumnal arches inside his show windows, and several others have given decorative touches for the week, but the sales organizations of the dealers are stationed

in the exhibition space and the principal object is the gathering of names of prospects and the making of what sales are possible at the show.

While the dealers are anxious to close all the sales possible this week, they state that the big value they derive from the show is a big list of prospects and the business which follows.

Two Classes of Dealers Attend

Large Territorial Distributors and Subdealers—Former Transact Most Business

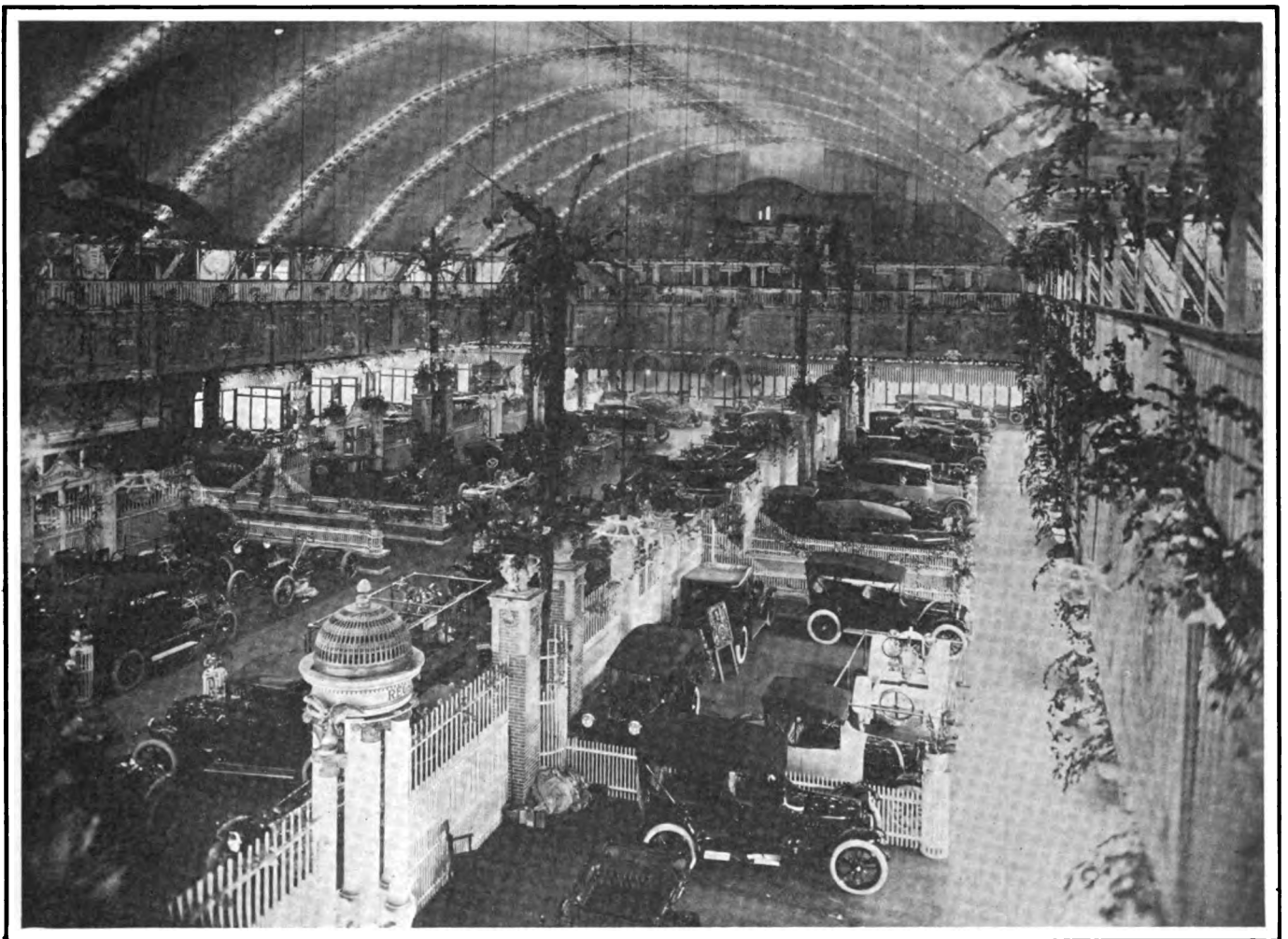
THE dealers who attend the show are of two classes, distributors and their sub-dealers. The Middle West is covered by numerous large distributors who are the headquarters in their terri-

tory for the product of the manufacturer they represent. The sub-dealer secures his cars through the distributor and it generally is the distributor who transacts business at the show with the exhibitor.

Many of the sub-dealers who attend are brought in by the distributors and many of the dealer contracts signed at the show are contracts between these two classes of business men. Most of the standard cars are well represented by distributors and leave the further distribution of the product up to this unit in the organization.

While the net result for the year may not be affected by the holding of the show, some of the distributors place orders for cars at this time; it is both a convenience to the contracting parties and a tonic to the trade. Last year the Omaha Cartercar man sat down in the exhibit and ordered two trainloads of Cartercars. There were other instances of the same kind.

Looking Across the English Garden



The picturesque formality of the typical garden of an English country house is brought out with great skill in the Coliseum. The stiffness of the fences is just sufficiently relieved by the climbing roses. While the roof of the Coliseum never can look like anything except what it is, the pergola beaming effect and the sky that shows between the rafters softens the harshness of the underlying architecture. The setting, as a whole, seems peculiarly appropriate for cars

Seven Prominent Chicago Motor Car Dealers



Left to right—A. Farrington, Farrington Auto Co. (Ohio electric and Detroit); Roy A. Herrington, general sales manager, American Electric Car Co.; Thomas J. Hay, Thomas J. Hay Co. (Chandler and Hupmobile); Gail Reed, general sales manager, passenger car division, Walker Vehicle Co.; W. G. Tennant, president, Tennant Motor Co., Ltd. (National, Moon, Abbott, Simplex); F. M. Busby, sales manager, Louis Geyler Co. (Hudson); Louis Geyler, Louis Geyler Co.

Entertainment a Feature of Show

Meetings and Dinners Scheduled for the Week—Maxwell Has Movie Show

ENTERTAINMENT for the dealer is one of the principal businesses during show week. The Maxwell Motor Co. is utilizing the entire art floor of the Blackstone and has set aside a room for dealers. The moving pictures which were a feature of the Maxwell headquarters in New York are shown here. There is a buffet lunch and representatives of the service, engineering, designing, sales and executive departments are in attendance. About 500 dealers are expected. Dinners and meetings are numerous. The week's program includes:

Monday—**Overland**, Hotel La Salle, 9:30 P. M.

Tuesday—**Chalmers**, luncheon, Auditorium, 12:30.

E. V. A., Metropole, luncheon, 12:15.

Electrolytes, 35th and Cottage Grove, 10:30 P. M.

Garage Owners' Association of Illinois, Lexington, meeting.

Wednesday—**Saxon**, Annex, 7 P. M.

Franklin, Annex, 7 P. M.

Mitchell, train to factory 9 A. M., returning 2 P. M.

Dodge Bros., Railway Club, 1 P. M. Meeting for the formation of a national garage association, Lexington Hotel.

Thursday—**Jeffery**, Congress, 7 P. M.

Briscoe, Hotel Planters.

Chicago Automobile Trade Association, 12:30.

Chicago Athletic Association.

Crow Motor Car Co., Annex.

Meeting for the formation of a national garage association, Lexington Hotel.

Saturday—**Chandler**, dinner, Annex.

Census of the Show

	1915	1914
Total Exhibitors.....	302	289
Car Exhibitors.....	88	86
Accessory Exhibitors.....	214	203

GASOLINE CARS

Two-cylinder	0	6
Four-cylinder	120	121
Four-cylinder (Sleeve valve)	13	6
Six-cylinder	109	100
Six-cylinder (Sleeve valve)	1	2
Six-cylinder (Rotary valve)	0	1
Eight-cylinder	11	0
Total	254	236

BODY TYPES

Touring	122	139
Roadster	42	42
Limousine	11	11
Coupe	6	15
Berline	0	6
Raceabout	4	0
Sedan	7	8
Cabriolet	5	2
Brougham	3	0
Cyclecar	0	12
Total	200	235

CHASSIS

Four-cylinder	19	13
Four-cylinder (Sleeve valve)	3	0
Six-cylinder	18	17
Eight-cylinder	3	0
Electric	1	3
Total	44	33

ELECTRIC CARS

Coupe	20	2
Roadster	2	2
Coupelet	2	0
Brougham	0	27
Limousine	0	2
Total	24	33

Moving Displays Arouse Interest

Eye-Catching Ads Produce Unusual Effects and Bring Out Strong Points

A NUMBER of exhibitors use moving displays to attract attention. The Vacuum Oil Co. has a vertical semi-circular cardboard disk cut in fan-shaped sections. By the overlapping of the sections three separate colors with three separate advertising mottos are obtained. The effect is unusual and the interest great. The device is operated by a small motor with belt and gear construction. The Dyneto company has one of its lighting and starting units running in a glass bath of water. In the Pyrene booth are cut-outs of a car and a man puts out a fire with a Pyrene extinguisher.

TWO CHICAGO SMILES



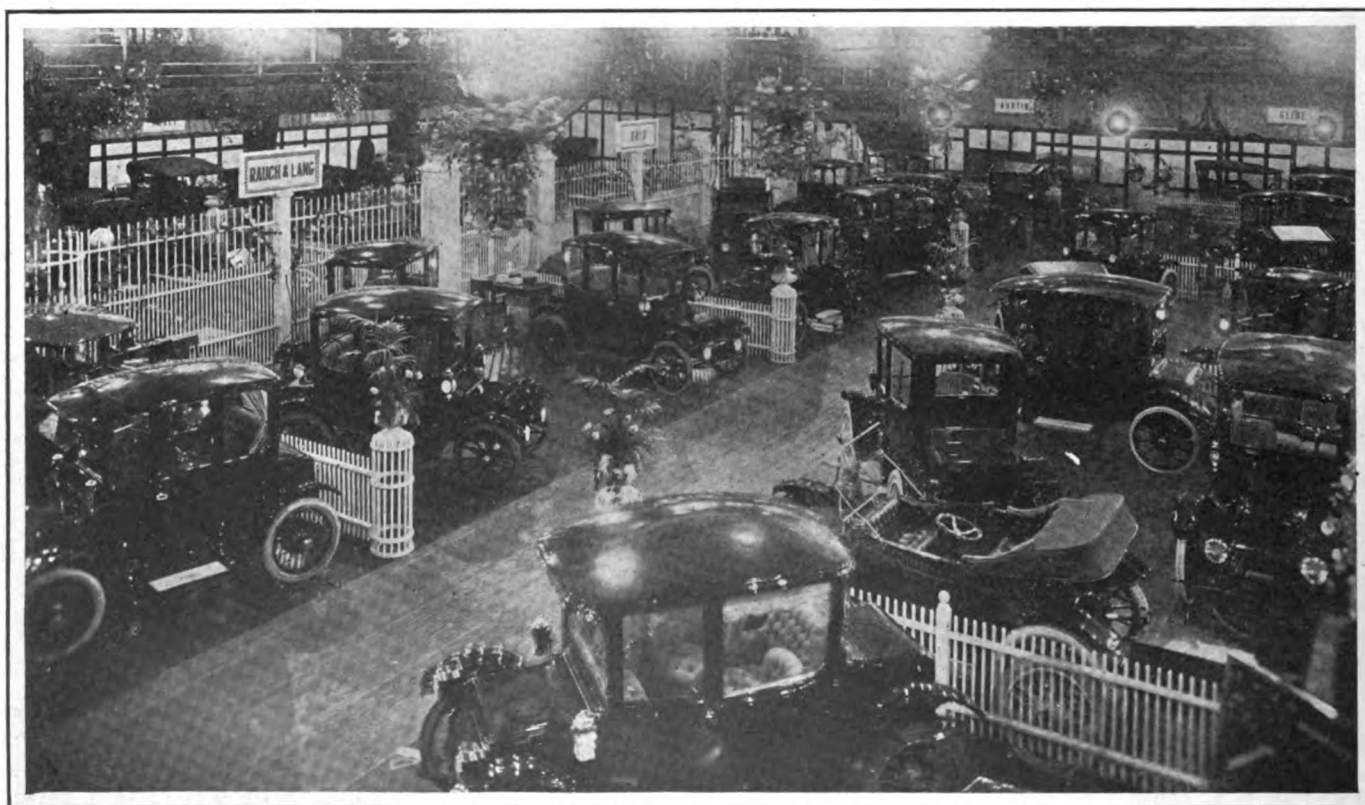
H. M. Allison, of the Packard Motor Car Co., president of the Chicago Automobile Trade Association, and F. E. Parker, sales manager of the Packard Chicago branch

Dealers Who People Coliseum and Armory This Week



4—H. J. Jones, engineer, Stutz Motor Car Co.; 5—A. A. Landry, secretary and treasurer, Stutz Motor Car Co.; 6—J. T. Parsons, salesman, Stutz Motor Car Co.; 7—Burton Schrock, salesman, Stutz Motor Car Co.; 37—E. W. Schillo, Schillo Motor Sales Co. (Mercer); 38—Leonard Lorimer, Schillo Motor Sales Co.; 30—Lafayette Markle, L. Markle Co. (Studebaker); 31—Henry Levy, L. Markle Co.; 10—W. E. Stalneck, vice-president, Pathfinder Motor Car Co.; 11—Charles E. Eichinger, sales manager, Pathfinder Motor Car Co.; 12—H. G. Musgrave, salesman, Pathfinder Motor Car Co.; 13—G. C. Burton, salesman, Pathfinder Motor Car Co.; 17—B. C. Buston, Reo Auto Co.; 18—O. C. Owen, Reo Auto Co.; 3—A. J. Banta, manager, Locomobile branch; 16—A. L. Ellwood, sales manager, Locomobile branch; 14—W. B. Herrick, sales manager, Cole Motor Co.; 15—E. C. Frady, president, Cole Motor Co.; 8—S. W. McMichael, assistant manager, Marmon-Chicago Co.; 9—Mr. Gambill, manager, Marmon-Chicago Co.

English Garden Setting of Chicago Show



The English Garden motive is carried out with the aid of white picket fences on which red roses entwine. Overhead the great roof is given a pergola effect with the blue sky showing between the beams. The names of the cars exhibited are lettered on ornamental gates and on boards on the fences. The upper picture shows the Coliseum with its new scenery; the lower view is of Electric Alley, in the Armory, where the exhibitors of electric cars congregate

New Eight-Cylinder Motors Rivet Attention.

Chicago Exhibition Reveals Four Additional Eights, Cole, Regal, Ross and Abbott-Detroit—Moline-Knight Light Four

AS in New York so in Chicago. The eight is the feature of the new cars which make their first appearance at the Coliseum exhibition. There are four new eight-cylinder cars on display in addition to those which were shown at Grand Central Palace. These are the Cole, the Regal, the Ross, and the Abbott. In addition, two new eight-cylinder motors are shown by engine makers, one being the Davis and the other the Buda. Two new small sixes are on view, the Imperial at the Coliseum and the Halladay on Motor Row. New fours in every case are smaller than those the concerns exhibiting them had previously used. The

new Moline-Knight is the smallest Knight engine which has appeared in America; the Regal four is a smaller four-cylinder engine than the Regal previously has designed.

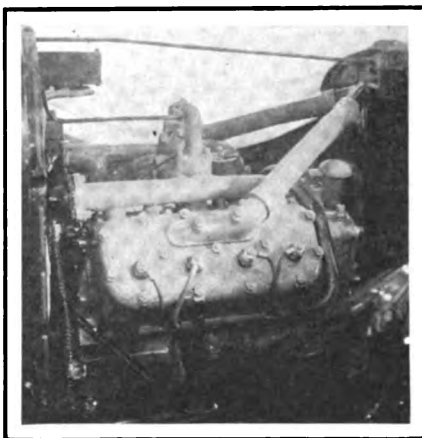
In all there are eight new cars or new models not previously shown, to be seen either at the Coliseum or in private exhibitions. The Franklin company has announced a new series whose only change in design is the enclosing of the overhead valves. In the electric field the only change within the past two weeks has been in the announcement of wire wheels as stock or optional equipment on practically every electric.

New Eight and Four Complete Regal Line

Eight in Five-Passenger Form Sells for \$1,250, Small Four Listing at \$650

THE Regal Motor Car Co., Detroit, is showing two new cars at the Coliseum, the complete Regal line for the coming season being three models, a new eight, a new small four, and the older four. The eight-cylinder car sells in the five-passenger touring form at \$1,250. It has a V-type motor, $2\frac{7}{8} \times 4\frac{1}{2}$ inches, and has a 112-inch wheelbase. Equipment includes, aside from the regular fitment, a one-man top with Jiffy curtains, tire carrier at the rear with an extra rim.

The eight cylinders are cast in two blocks of four each, the cylinders being of the L-head type with the valves on

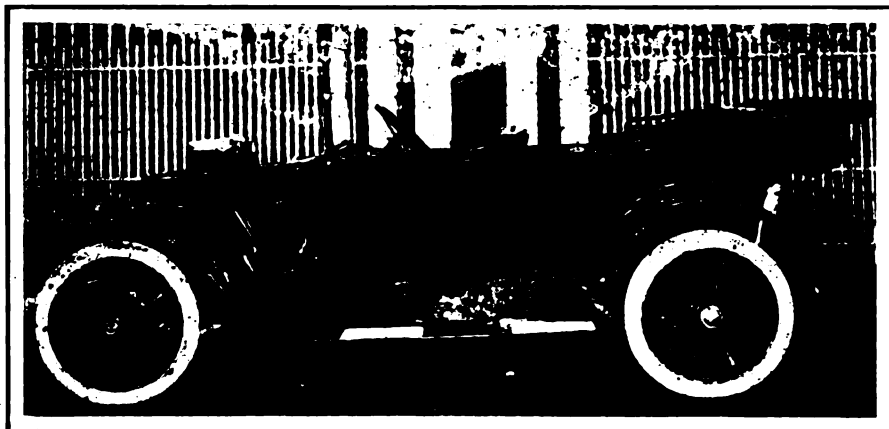


Motor of Regal eight, showing arrangement of outcured water pipes

the inside. Externally, the motor is made particularly clean by means of a removable horizontal plate connecting the two sets of cylinder heads. The plate can be removed for valve adjustment. The cylinder heads are remova-

ble, one casting covering each block of four cylinders. The electric equipment includes a Rushmore generator on the forward left side of the engine with the cranking motor connecting to the fly-wheel. Ignition is obtained by battery and distributor. Above the plate, connecting the two sides of the V, is the Stewart carburetor, which communicates with each block of cylinders through a ram's-horn intake to the integral manifold. The engine is cooled by thermo-syphon circulation of water, there being a single outlet at the top of the radiator with branches to each block of cylinders in the form of a Y. The timing gears are chain driven.

In other respects than the motor the car is exactly the same as the older Regal, and it is significant that the use of the eight-cylinder engine has added only 44 pounds to the total weight of the car, while the horsepower has been very considerably increased.



A new Regal model is a little four with motor $3\frac{3}{4} \times 4\frac{1}{4}$ and selling for \$650 with complete electric equipment and one-man top. Wheelbase is 106 inches



Carburetor side of the Regal four-cylinder motor, which embodies ingenious features

The other new Regal model is a little four having a $3\frac{3}{4} \times 4\frac{3}{4}$ -inch engine of nominal 20 horsepower, $30 \times 3\frac{1}{2}$ -inch tires, 106-inch wheelbase, and selling at \$650 with complete electric equipment and one-man top.

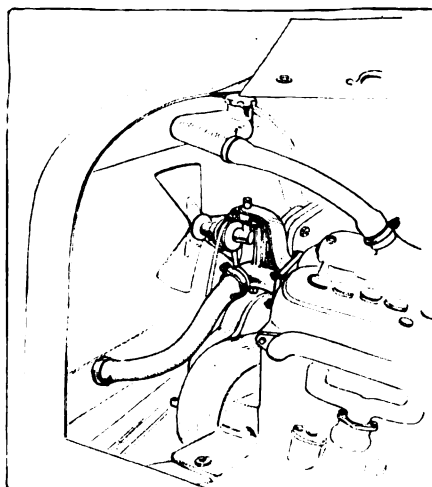
The four cylinders are a block casting and the clutch and gearset are carried as a unit with the engine. The electric equipment includes a Splittorf-Apelco motor-generator with battery ignition. The gearset is a three-speed selective with center control. Rear axle is floating on roller bearings, and the rear springs are of the cantilever type. The wheels have demountable rims. A streamline type of body is supplied, which, like the rest of the Regal models, has the radiator filler under the hood so that the smooth line from windshield to radiator is not broken. The fuel is carried in the cowl and the filler is inside the forward compartment. A spare tire carrier is supplied at the rear.

Another of the new cars to make its debut at the Coliseum is the eight-cylinder Cole, at \$1,785, which was described in detail in Motor World, January 20.

Eight Cylinder Ross Thermo-Syphon Cooled

**Five-Passenger at \$1,350 Has 115-Inch
Wheelbase and Electric Equipment**

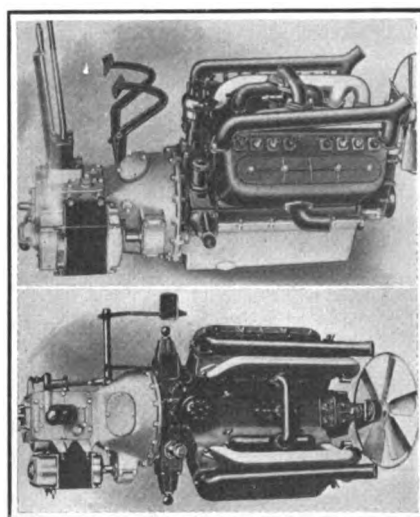
A new car makes its debut in eight-cylinder form at the La Salle Hotel. This is the Ross eight. It is the production of the Ross & Young Machine Co., Detroit, Mich., a concern which long has been making parts for Detroit car manufacturers. Aside from its eight-cylinder motor the feature of the car is its price, which is \$1,350 for the five-passenger touring model, the only body offered at this time. The motor is made by the



Combined water connection and fan bracket of new Regal four

Ross & Young company in its own plant.

The eight cylinders are arranged in a



The Ross eight-cylinder motor has cylinders $3 \times 4\frac{1}{2}$ and chain driven camshaft

V and are $3 \times 4\frac{1}{2}$ inches in size. The cylinders are cast in blocks of four and are L-head in shape, with valves on the

inner side. The camshaft is driven by a silent chain and thermo-syphon cooling is used. Lubrication is by oil forced to cylinders, crankshaft and camshaft by means of a plunger pump. Ignition is by an Atwater-Kent Unisparker having automatic advance with both dry cells and storage batteries as a current source. Fuel is fed to the carbureter from a rear tank by the Stewart vacuum system.

Starting and lighting is by an electric system of Ross & Young's own manufacture. It operates on 12 volts. A multiple disk clutch with cork inserts is used and in unit with the rest of the power plant is a three-speed selective gearset with center control. The unit power plant thus supplied is suspended at three points.

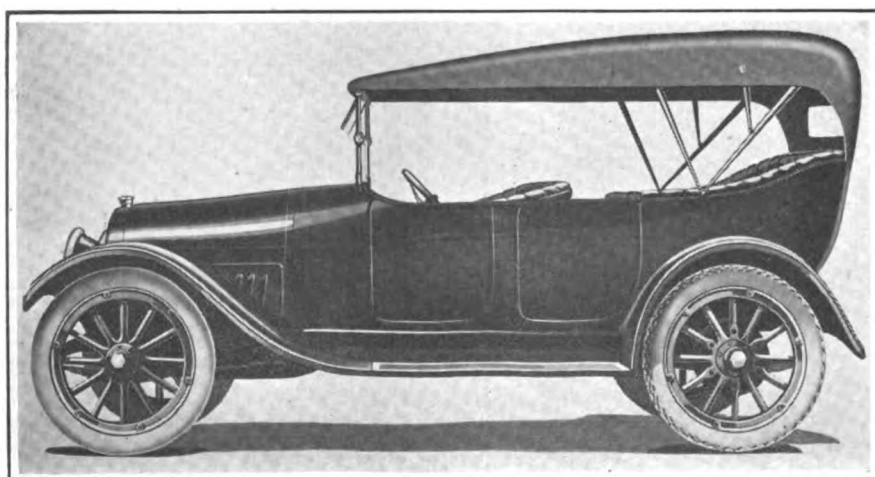
The drive from the propeller shaft and Timken axles is taken through the springs on the Hotchkiss principle. Brakes are $14 \times 2\frac{1}{4}$ inches in size, the service brakes being internal and the emergency brakes external on rear wheel drums. The wheelbase is 115 inches and tires 34×4 on Detroit Q. D. rims. Springs are three-quarter elliptic in the rear and the conventional semi-elliptic in front. The equipment includes a one-man top in addition to the regular outfit. A very clean streamline boat-shaped body is provided in which the line from radiator to cowl is continuous.

Ogren Six Makes Its Debut at the Show

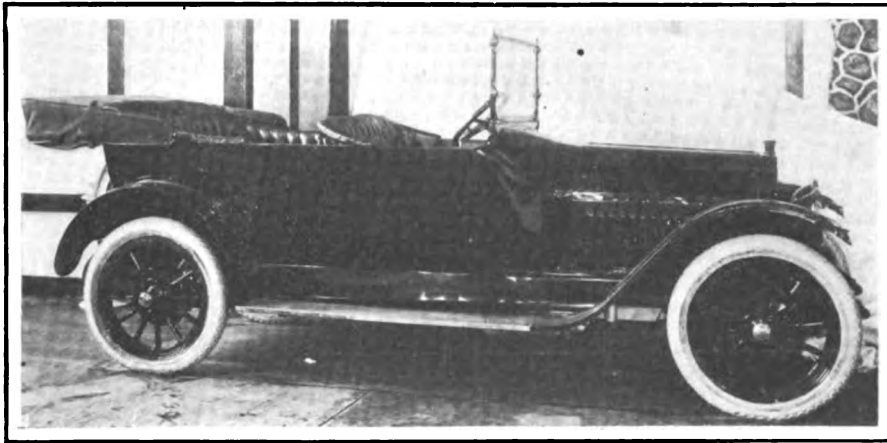
**Standard Parts Mark Product of Chicago
Firm—7-Passenger Lists at \$2,500**

A six-cylinder car new to the field in general is the Ogren Six, which has been on the market in a small way for about a year. This is the product of the Ogren Motor Car Co., Chicago, and it is expected to turn about 250 cars within the next 12 months. The car is built from standard parts as a seven-passenger touring car, a roadster, and a limousine, the seven-passenger touring model listing at \$2,500.

The engine is a six-cylinder $3\frac{3}{4} \times 5\frac{1}{4}$, L-head, with Bosch magneto, Bosch-Rushmore cranking and lighting, Rayfield carbureter, Stewart vacuum fuel feed, Brown-Lipe three-speed gearset, left steering, center control, Timken axle and Kellogg power tire pump. The body is made by Obresch. In the seven-passenger touring body the extra seats are arranged to fold in the back of the front seat when five passengers are carried.



The Ross eight is built with five-passenger body and sells for \$1,350. It is built by the Ross & Young Machine Co., Detroit. Wheelbase, 115; tires, 34×4

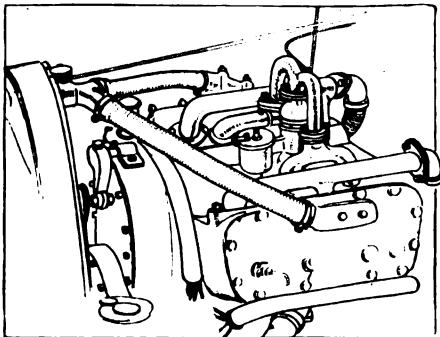


The new six-cylinder Imperial, model 66, sells for \$1,285 with complete equipment. It has a block Continental motor, 3 x 5, and five-passenger body

Imperial at \$1,285 is Latest in Six Field

**Block Continental Motor, Disk Clutch
and 122-Inch Wheelbase Features**

A new six-cylinder Imperial makes its appearance at the Coliseum; this is styled Model 66 and lists at \$1,285 with electrical equipment, one-man mohair

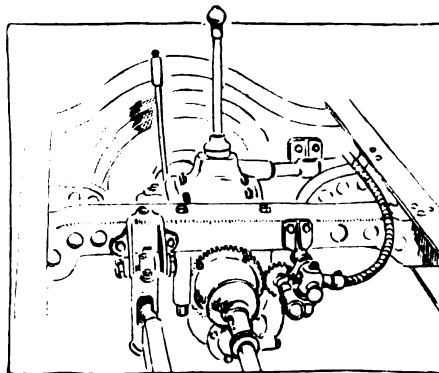


Regal eight, showing overhead branch pipes from carburetor to headers

top, demountable rims and regular equipment. The motor is a block-cast Continental, with cylinders of the L-head type, 3 x 5 inches in size. Cooling is by centrifugal pump and lubrication is by splash system with a circulating pump. A disk clutch faced with Raybestos and a three-speed selective gear-set form the unit power plant, which is suspended at three-points. Fuel is fed by pressure from a gasoline tank at the rear. The rear axle is a floating type on Hyatt high-duty roller bearings, with a 4 to 1 reduction on high; 12-inch brakes, internal and external, are supplied on the rear hubs. Left steering and center control is standard. The wheelbase is 122 inches and tires are 33 x 4. The storage battery for the electric lighting and cranking system is carried under the front seat. The rear springs are three-quarter elliptic, and

the body upholstery is made a special point, being designed to give maximum comfort without sagging after continued use.

The car is marketed as a five-passenger tourist, body lines being of the

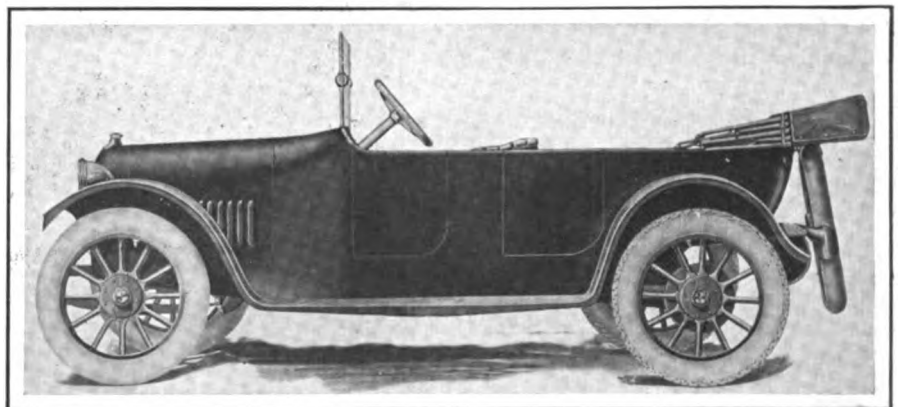


The National speedometer drive is from the propeller shaft at rear of gearset

streamline type with clean running-boards and a gentle curve from the back of the hood to the windshield. The doors are unusually wide and have concealed hinges and latches.

New Buda Motor Appears

The new eight-cylinder engine of the Buda Motor Co., Harvey, Ill., which



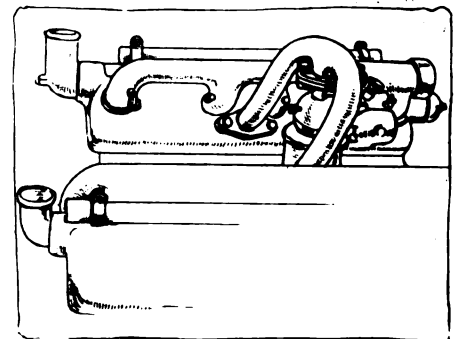
New Moline-Knight which sells for \$1,475 and has 3½ x 5 motor, 118-inch wheelbase and 34 x 4 tires. Equipment is complete, including electric starting and lighting

makes its first appearance at the Chicago show, was described in detail in Motor World, January 20. The motor is of the usual V-type with the cylinders in two groups at 90 degrees.

Taxicab Designed to Facilitate Repairing

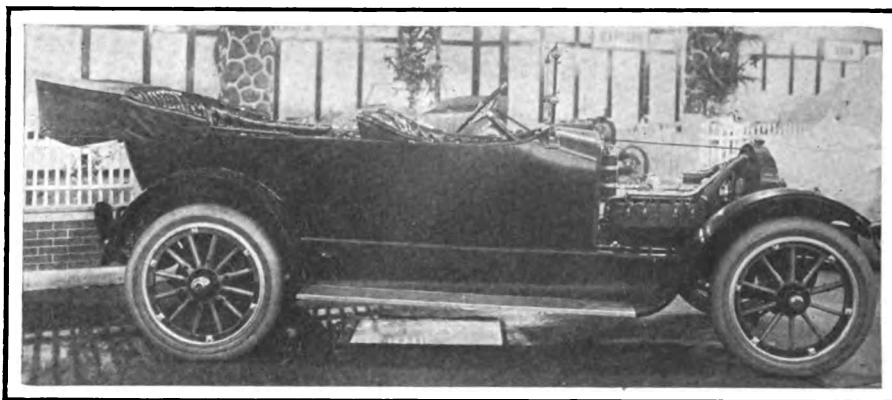
**Chassis Has Transmission Brake, No
Equalizers and Spiral Bevel Drive**

Although not at the show, a new car is on display on Motor Row as the product of a concern which heretofore has not built cars for the general market. These are the taxicabs of the Walden W. Shaw Livery Co., Chicago. This concern has been building its own cars for local taxicab work for several years, but the demand from other cities for cars especially designed for this service has lead it to manufacture these cars for other livery companies. Orders from several other cities have been received and the concern states that it is in position to produce about 500 cars a year.



Carburetor and arched intake pipe on Davis eight; valve springs are accessible

The cars are designed for quick and easy repair and replacement, as well as for wearing qualities for the special service for which they are designed, and their one or two outstanding features which distinguish cars for this service,



The eight-cylinder Cole, which makes its debut at the Coliseum, sells for \$1,785 with the usual complete equipment

as designed by the Walden Shaw company.

One of these is the transmission brake, another the spiral bevel drive, and another the elimination of brake equalizers, it being found that in livery service, where for safety sake the brakes must be looked to every day, equalizers are a detriment. Easy gear shifting is made possible by a clutch brake. There is no spark advance, and a triple oiling system is provided, there being a constant level splash and force feed in addition to two plunger pumps operated by the camshaft. The pumps can be worked independently of each other, and in case both fail, sufficient lubrication for a 60-mile drive is provided in the splash reservoir.

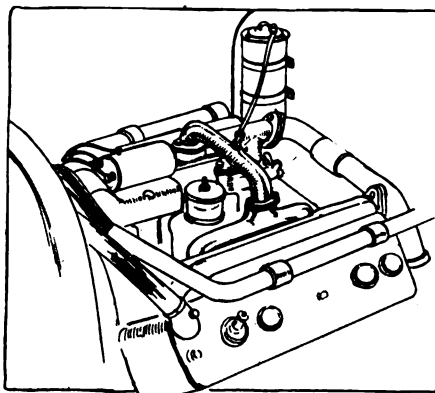
To show in what way the special design has been effective in keeping down operating costs, the Shaw company reports on the maintenance of its entire equipment for a period of six months show that the labor and maintenance per cab per day is but 57 cents. The cost for materials is 35 cents and for painting 17 cents, making a total bill daily on each cab of \$1.09.

New Halladay Line Built Around Six

**Barley Mfg. Co. Announces Electrically
Equipped Boat Model at \$1,385**

Halladay cars, after a period of inactivity, are again to make their appearance on the market, this time as the product of the Barley Mfg. Co., Streator, Ill. The reappearance of the Halladay is signalized by a new six-cylinder product called the 6-40, which is to sell at \$1,385. It embraces in design an L-head, block Rutenber motor rated at 40 horsepower. Oiling is by a combination force feed and circulating splash, cooling by centrifugal pump circulation with a belt

driven fan. The carbureter is a Stromberg with steering column air control. The electric equipment is of Westinghouse make, a combined magneto and



Removable manifold and carburetor arrangement in motor of Cole eight

generator supplying the current for ignition and lighting, and in connection with the 6-volt, 100-ampere-hour battery, the Westinghouse flywheel starting motor, which is equipped with a Bendix gearshift.

The three-speed gearset and disk clutch are in unit with the motor, the whole power plant having three-point suspension. Gasoline is carried in a rear tank and supplied to the carburetor by the Stewart vacuum system. Left steer and center control are stock features. A floating rear axle which runs on ball bearings is supplied and the rear springs are three-quarter elliptic. Tires are 34 x 4 inches on Firestone or Stanweld demountable rims, and a spare tire carrier is hung at the rear.

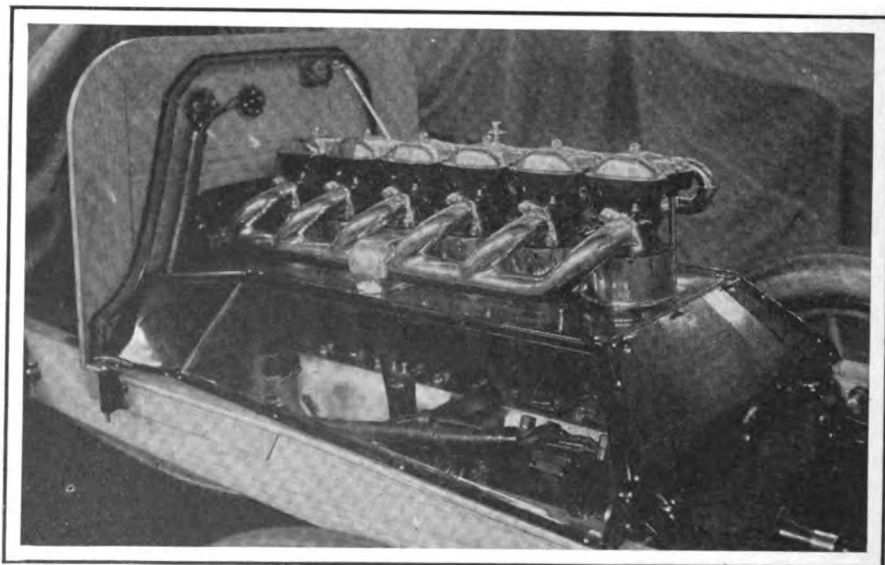
The body is of modified boat type with a smooth line from radiator to windshield. Individual front seats are fitted and there is an aisle way between them. With the regular equipment is included a one-man top and an eight-day clock.

New Series Franklin Has Enclosed Valves

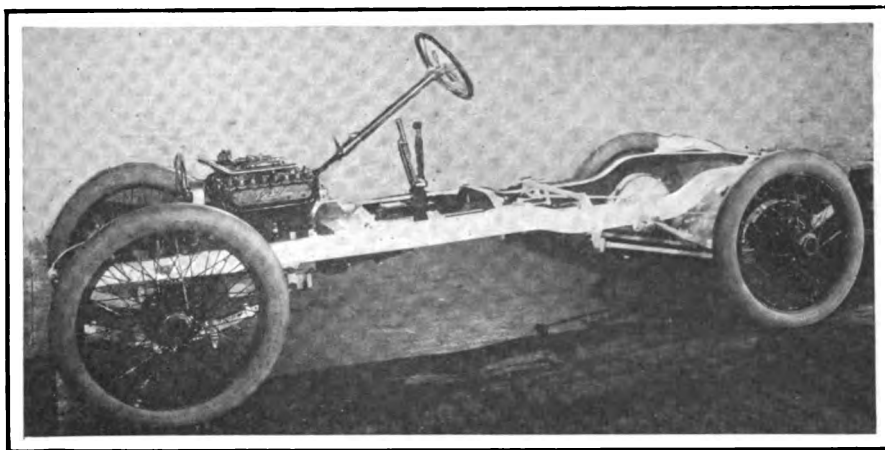
Individual Removable Cover Plates Added and Chassis Materially Lightened

A new Franklin chassis makes its appearance under a new model name, Series Seven. The feature of the new series is the enclosure of the overhead valves. Aside from this the only alterations from the car as described previously is the slight lengthening of the tonneau to give increased roominess and a general lightening of the chassis which amounts to a reduction of probably 24 pounds in the weight of the car as a whole.

The enclosure of the valves has been accomplished by placing a metal cover over the valve operating mechanism on



In the new Franklin Series Seven the valve mechanism, which is of the overhead type as in the past, is enclosed. The price is unchanged



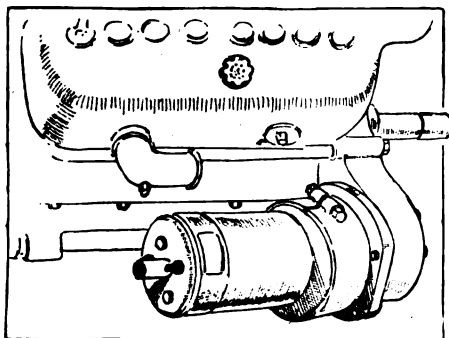
The chassis of the Abbott-Detroit eight-cylinder car is characterized by clean design. The frame has a kick-up in the rear. The motor is a Perkins

each of the separate cylinder heads. These covers bolt to flat bosses milled on top of the cylinder heads, and cover the valve springs and rocker arms completely, thus giving the increase in efficiency of the overhead valve without the noisy valve operation which sometimes is characteristic of this type. The price of the Franklin car remains at its former figure.

Davis Enters Field With Eight Cylinder

**Conventional V-Type With Cylinders
3 x 4—Double Camshafts Are Used**

One more eight-cylinder motor has made its appearance and this time the Davis Mfg. Co., Milwaukee, Wis., is the newcomer, with a 3 x 4 V-type design with cylinders at 90 degrees. It is a conventional design, giving a piston displacement of 226.2 cubic inches and an S. A. E. rating of 28.8 horsepower. The

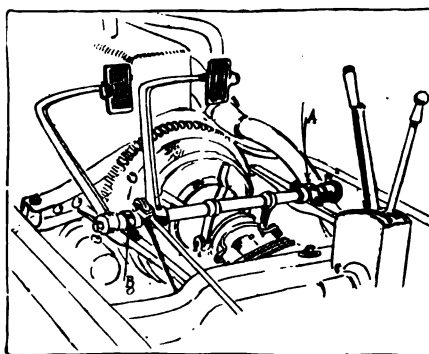


Allis-Chalmers motor-generator on Davis car, adjustable by turning on an eccentric

motor is of the high-speed type, showing its greatest efficiency between 2,200 and 2,600 r. p. m., and is intended for a gear ratio of approximately $5\frac{1}{2}$ to 1.

Two of the unconventional features of this Davis eight are, first, the use of two camshafts located side by side in the

top of the crankcase, immediately below the apex of the V. One camshaft serves for actuating the valves in one cylinder block and the other for the opposite block, the object being to permit any desired timing; the use of rocker arms between the cams and the tappets is



On the Jeffery six one grease cup at A lubricates bearings at A and B

eliminated, correspondingly reducing the possibility of noise. The timing is: Intake opens 10 degrees late, closing 30 degrees late, and exhaust opens 45 degrees early, closing 5 degrees late. The tappets have mushroom ends bearing directly on the cams.

The other unconventional feature is the employment of thermo-siphon cooling for the two-cylinder blocks.

Spur gear trains are used for driving the two camshafts as well as the ignition system, a silent chain being employed to connect the crankshaft with the Allis-Chalmers motor-generator unit which is mounted under the right front motor arm. It is geared 3 to 1 to the crankshaft and no clutches are interposed, the silent chain connection being positive. In order to have chain adjustment the motor-generator is mounted in an eccentric bushing surrounding the entire cylindrical unit, and this bushing in turn is clamped into the housing.

Lubrication is by splash constant-level

system, and to guard against a surplus of oil in one cylinder block baffle plates are inserted in the open ends of the cylinders in this block, the other block being without baffles. The carbureter is located high in the V and attaches to an upwardly arched semi-circular type of intake manifold.

The rotating and reciprocating internal parts of the motor are generally conventional. Use is made of the yoke type connecting rod in preference to the side-by-side style; these are I-beam types, 8 inches center to center; the crankshaft, a two-bearing type, has main and journal bearings $1\frac{1}{4}$ inches in diameter, the front bearing being 3 inches long, the rear 4, and all crankpins $2\frac{1}{4}$ inches long. Valves are $1\frac{5}{16}$ inches in diameter in the clear and $\frac{7}{32}$ -inch lift. Each camshaft is supported on three bearings. Pistons measure $3\frac{3}{4}$ inches in length and carry three rings close to the piston head and one oil ring immediately below the wristpin.

The motor is regularly designed to take a unit gearbox, the flywheel being completely housed for this purpose, and with the two supporting arms in the flywheel plane.

Small Moline-Knight Which Sells for \$1,475

**Motor With Cylinders Measuring $3\frac{1}{2}$ x 5
Has Clever Ignition Wiring Method**

The Moline Automobile Co., Moline, Ill., is showing the motor of a smaller Moline-Knight car which is to be announced later. The motor itself is almost a replica of the larger Moline-Knight, except for the reduction in dimensions. Its bore is $3\frac{1}{2}$ inches and its stroke 5 inches, valve operation being of the Knight sleeve valve principle. The cylinder casting is particularly clean exterior appearance. The only distinguishing feature between this engine and the larger Knight is in the unique way in which the ignition wires are carried. These are carried up through the cylinder head, between the two middle cylinders, so that the only exposed wires for ignition are the short leads from the central point of emergence to the spark plugs. Ignition is effected by means of a Connecticut igniter, current for which is produced by a generator driven by a lay shaft on the timing gears. A separate cranking motor connects with gears cut on the flywheel. Another external change is the alteration of the exhaust manifold to give a more direct flow of gas. The car sells for \$1,475.

Chicago Show Reveals New Accessories

More Than a Score of Novel and Useful Devices Exhibited— Combustionless Car Heater and Three-Spring Shock Absorber

THE New York show revealed the cream of the new accessory crop. Nevertheless there is much at the Chicago exhibition this week that should be of interest to the dealer, the garageman and the supply-house proprietor. More than two dozen devices new to the accessory world have been uncovered.

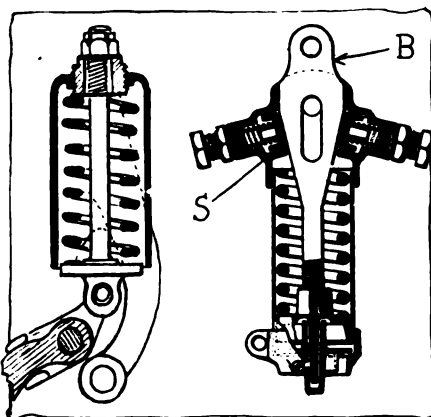
Of these, the Westinghouse system which has been developed for lighting, starting and igniting the Ford, has attracted much attention, for there were few who know that this company held such a system up its sleeve, so to speak. Almost as surprising a revelation is made by the Kellogg company, which has brought

out a new single-cylinder engine-driven pump for Fords.

Chicago always can be relied upon to bring to light at least one new spring wheel and at least one new safety fender, and they are both there. In addition, there is a new heater which uses neither coal nor other combustible material, a new shock absorber which has three springs instead of the usual two, and a new seating arrangement which converts the orthodox two-passenger car into a three-passenger car without altering its lines.

The Westinghouse exhibit is featured with a new cranking, lighting and ignition system for Ford cars which sells for \$90 and which consists of a 12-volt motor-generator, battery and ignition distributor which contains also the interrupter and step up coil. Externally the motor-generator differs but little from the regular Westinghouse unit. It is driven by silent chain from the crankshaft and in order to allow of a means of driving the fan the belt is fastened to a pulley on the motor-generator shaft. The cut-out which is used is a separate unit. In the mounting of the motor-generator two brackets are used, one of them being attached to the cylinder head by means of special bolts and the other being attached to the lower por-

tion of the forward cylinder casting of the block.



The Frazer shock absorber has three springs in each cylindrical casing—Left, Ford type

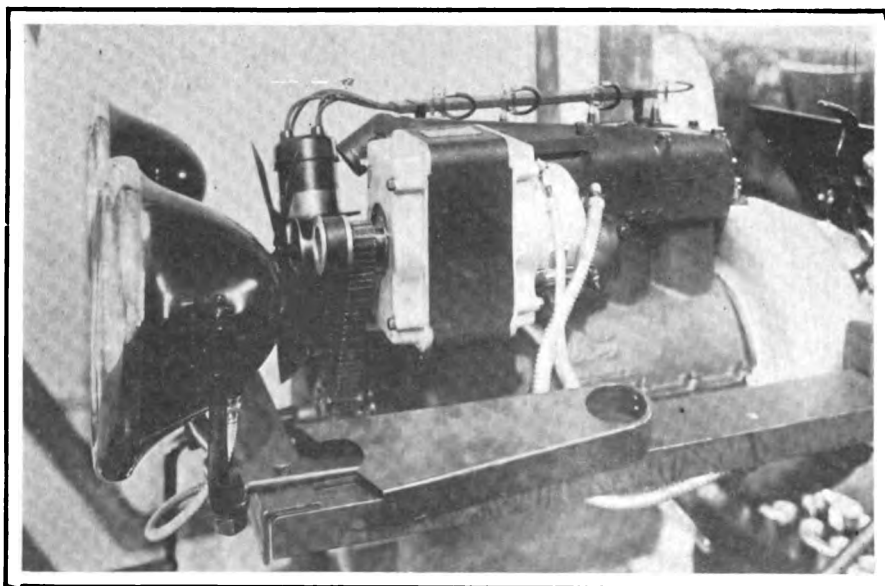
The ignition distributor is an entirely new affair, being a combination timer, distributor and coil. It is located on the opposite side of the motor-generator and is driven by two bevel gears from the timing case. This allows of a vertical unit. The price is \$75 for the motor-generator, battery, switch, wiring, in fact, everything except the lamps, and at \$90 the ignition distributor also is furnished.

New Ashland Jack

The Ashland Mfg. Co., Ashland, O., exhibits a new type of jack, suitable for cars up to 5,000 pounds. Its main feature is that it employs a steel rack bar with cut teeth instead of the conventional malleable iron one. Another feature is the quick release attachment by which the raising bar may be lowered instantly. The control for up and down movement is in the form of a small lever. The handle is either of wood or metal, in the latter case a tire tool being furnished. The price is \$1.90. Another new product of this maker is the Atlas tire-saving jack, which sells at \$5 for four. The handle of this jack is fitted with a steel roller bearing to reduce wear and make operation as easy as possible.

Pencil Tire Gauge

A tire gauge with a new type of internal mechanism is shown by E. Edelman & Co., Chicago. While it is of the pencil form it employs instead of a rubber tube, a series of metal sleeves which telescope into one another much the same as a collapsible tumbler. The air causes these sleeves to extend them-



The Westinghouse starting-lighting system for Ford cars is built on standard Westinghouse lines and is easily installed

selves and thus push a cylinder upward. There is a mark on this cylinder which indicates on a spirally cut scale the pressure in the tire. The price is \$1.

Three Spring Shock Absorber

An entirely new type of auxiliary spring shock absorber is shown by the Frazer Lubricator Co., New York. It consists of two cylinders, each containing three springs, one set upright and two smaller ones placed at an angle above it. Each spring has an individual cylinder for operation.

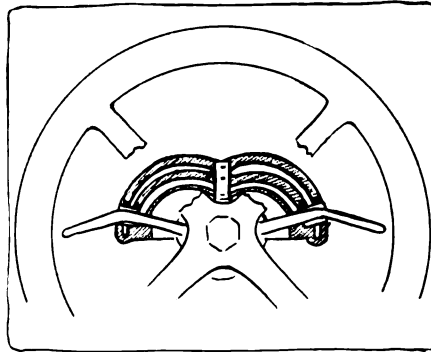
Aside from the three springs there is an air cushion cylinder below the large spring. The bar B is wedge-shaped at its upper end and that the sides can touch the shoes S under the two smaller springs. It is clear that any upward movement of the bar B will carry with it the large spring, leaving the two smaller ones free, and in order to make the large spring return to normal slowly the air chamber shown comes into play. Also, the downward movement of the bar causes the wedge to exert pressure against the two shoes and hence the smaller springs are compressed. The price is \$40 for cars up to 2,200 pounds. A Ford type is shown, but it employs only one large spring, which is fitted into a cylinder open at the bottom as shown in the illustration herewith.

Ford Auxiliary Quadrant

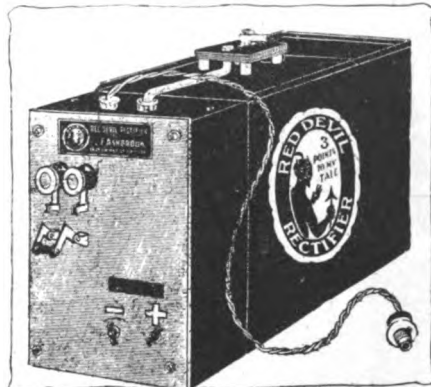
The Pierce Speed Controller Co., Anderson, Ind., is showing something novel in the way of a Ford accessory in what is called the Pierce auxiliary quadrant. This is a throttle quadrant which is fastened to the one already on the Ford car. It allows of the throttle lever being adjusted more accurately, the regular sector requiring that the lever be set into cuts in the quadrant. These cuts, the Pierce company claims, increase the speed one-third of a mile per hour, which often is not accurate enough for the driver. With the Pierce device the lever may be moved any fraction of an inch. The price is \$1 and it may be installed easily by any owner.

Niehoff's Ford Lighter

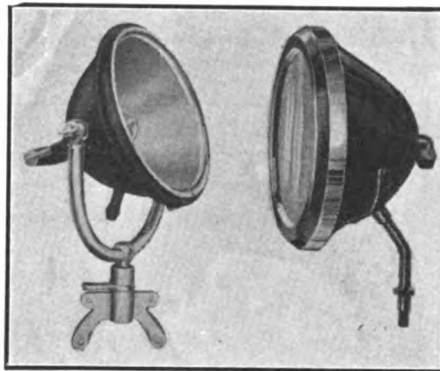
A new Ford lighting system is being shown by Paul G. Niehoff & Co., Chicago, the outfit consisting of a generator driven by belt from the fan shaft, a battery, cut-out, ammeter, wiring, etc. The generator produces 8 amperes at 6 volts, and is driven by a belt which is looped around a special pulley fastened to the fan shaft. The cut-out is a separate unit mounted on the dash together with an ammeter and switch. The outfit com-



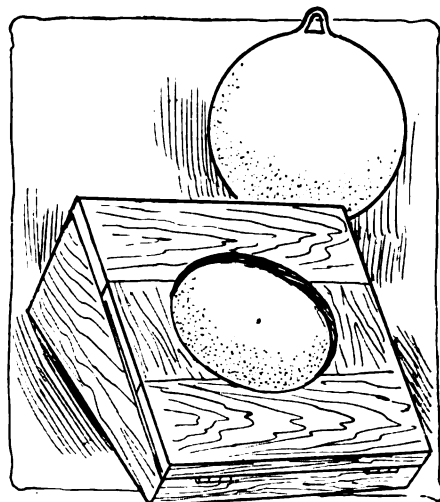
Pierce auxiliary quadrant permits Ford levers to be set at any point



Red Devil electrolytic rectifier with maximum capacity of 9 amperes



Left, Badger Brass Mfg. Co.'s new electric searchlight—Right, Vesta lamp



Radiumotor—combustionless car heater which uses no coal

plete, including the parts mentioned and two headlights and tail light, 6-volt 80-ampere-hour battery, wiring, bolts, etc., is \$45, and without the lamps is \$38.50.

Two other new products shown for the first time but marketed for about one year, are the Red Devil electrolytic rectifier and the Red Devil non-spillable battery.

Imperial Welding Outfit

The Imperial Brass Mfg. Co., Chicago, is showing for the first time its line of oxy-acetylene welding outfits. Five types are offered, four being mounted and one fitted to a platform truck. All come equipped with suitable torches and a number of special tips, high-pressure hose and clamps, regulators and all the accessories, such as goggles and wrenches. Besides the welding line, the concern is showing oxygen decarbonizers, pressure gauges and regulator valves for all classes of welding.

Vesta Batteries and Lamp

The Vesta Accumulator Co., Chicago, is displaying an entirely new line of batteries for starting and lighting service, and a new type of headlight for Ford cars. The new batteries are made in all standard sizes and in 6-, 12-, 16-, 18- and 24-volt form. All capacities are offered. A fair idea of the prices will be had from these: 6-volt 80-ampere-hour, \$35; 12-volt 80-ampere-hour, \$69.25, and 24-volt 53-ampere-hour, \$108. The new headlight is designed to take the place of the regular gas lamps and for this purpose a special bracket is furnished. The price is \$12 per pair.

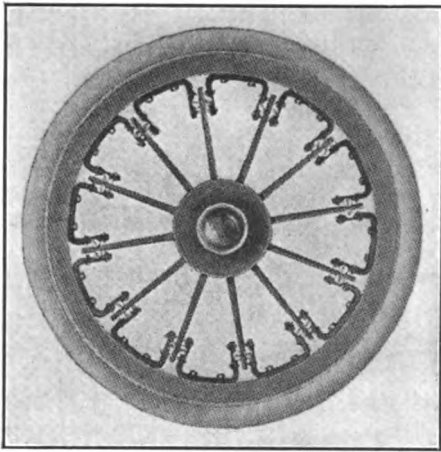
New Dixon Grease

The Dixon Crucible Co., Jersey City, N. J., is showing a new form of grease for differential housings which it claims will not make its way to the brake bands. It is No. 680 and sells for 30 cents per pound in 5-pound tins.

Kellogg Ford Pump

Another new single-cylinder pump, Model 111, just brought out by the Kellogg Mfg. Co., is being shown at its booth for the first time. This new pump is for Fords and in general construction is like the one-cylinder model 101. It is an all-metal design with a poppet valve for inlet and exhaust, uses wick oiling and sells for \$9.50 complete ready for attachment. The drive is directly by gears from the front end, a hand lever being used to throw the gears into mesh. It is stated the pump may be installed in 20 minutes.

The Ajax Trunk & Sample Case Co.,



Gray Bros.' spring wheel has an elastic hub and special flange construction

New York, is showing a new outfit which contains a fireless cooker and utensils for six persons. The price is \$30. Included in the furnishings are two Thermos bottles. Besides this a complete line of such outfits is carried ranging in price from \$5 to \$60. Any one may be conveniently carried on the running board.

Hassler Ford Shock Absorber

While the principle has not been changed in the new Hassler Ford shock absorber being shown by R. H. Hassler, Indianapolis, Ind., a new type of spring is employed. The older type used a flat spring with convolutions of the same size, while the new one uses a spiral spring. The price has been reduced from \$25 to \$20 per set of four.

Solar Searchlight of New Design

A new type of searchlight is being shown by the Badger Brass Mfg. Co., Kenosha, Wis., the features being that it may be moved vertically or laterally with a lever and locked in any desired position. The lamp used is a new parabola design with the reflector in the body with a washer between it and the glass. The casing is water- and dust-proof and has an outside adjustment for bulb focusing. The searchlight complete sells for \$14.75 in black and nickel.

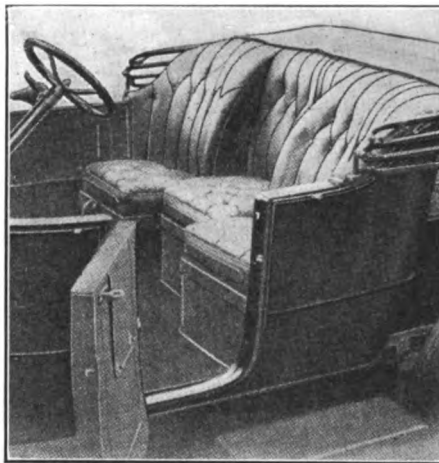
Chemical Heater Needs No Fuel

There is a new type of car heater which uses instead of coal, exhaust gas, etc., a special chemical compound which is contained in a polished metallic case. The case is immersed in boiling water and after removal the chemicals are said to retain heat for from 8 to 10 hours, depending upon the size of the heater. All forms and sizes are offered. The price is \$3, and when once purchased no additional material is needed, the chemicals being said to last indefinitely.

The concern showing the device is the Radiumetor Co., Chicago.

Spring Wheel With Elastic Hub

A new type of spring wheel is being shown by Gray Bros., Chicago. The wheel employs a flexible hub with special side flanges. These flanges are fitted with slots into which the lower portion of special wedge-shaped steel spokes fit. The upper ends of the spokes are in contact with rollers, so that when the wheel strikes an obstruction the spokes slide over the rollers, the movement being taken up in the hub slots.



The So-Sha-Belle seating design gives both roominess and compactness



The Day sectional puncture-proof casing has treads of rubber and fabric

The So-Sha-Belle Co., Los Angeles, Cal., is exhibiting for the first time a seating arrangement which allows of three persons sitting in the tonneau or front compartment where the present plan allows of only two being seated. It is an arrangement which places the seats in staggered fashion, the center one either ahead or behind the two outer cushions. This seating arrangement may be used on either old or new cars and requires no changes in the upholstery

and seat frame and does not interfere with the body lines.

A puncture and blowout preventing device is shown by the Day Sectional Casing Co., Chicago. It consists of a rubber and fabric tread made in a number of sections fastened together so as to be slipped in place as a unit. There are spaces between each section and this together with the rough surface of the sections is said to prevent skidding. Prices range from \$18.75 for the 30 x 3½ to \$25.50 for the 37 x 4.

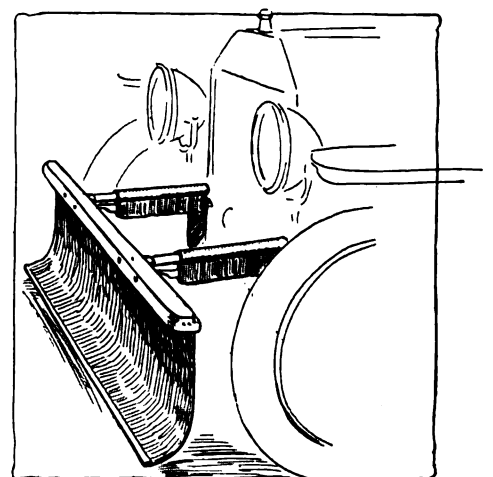
Safety Fender Stops the Engine

A new type of safety fender is being exhibited by the Telescope Fender Co., Cleveland, O., this device automatically stopping the engine and dropping a curtain to the ground so as to prevent the person from being caught under the wheels. When a person strikes the fender the ignition is cut out, the curtain drops and the fender is pushed back so as to prevent the person becoming injured.

Gasoline Motor With Slide Valves

A new type of slide valve engine is being exhibited by the Woodward Motor Co., Chicago, the engine operating on the four-cycle principle and having small semi-circular valves covering and uncovering valves in the cylinder wall. There are two valves per cylinder, one for the inlet and one for the exhaust.

An unusual type of motor in which four explosions are obtained every revolution of the flywheel, is shown by the Turbine Engine Mfg. Co., Chicago. It employs three crankshafts and four pistons, the latter instead of reciprocating revolving about the extension of the crankshaft. The explosions take place in the space formed by any two pistons and thus the latter are forced around, thereby turning the crankshaft.



The Telescope fender protects the person struck and stops the car

Systematic Planning for Public Recognition

Reilly Began Years Ago to Get in the News—It Was Hard Work But It Had a Result of Inestimable Value

By Ray W. Sherman

THE story opens in the hackneyed, stereotyped, theatrical way—Reilly sitting at flat-topped desk in office—telephone on desk—Jim, the factory Sales Manager, in chair at left—iron dog holding down pile of papers on desk—Nellie, the typewriter chauffeur, clicking away in private office—chairs, coat rack, et cetera colorado maduro.

As curtain rises Reilly wheels around in chair toward Jim and Tommy Trumbull goes out door, pulling on overcoat and jamming newspaper in pocket at the same time. Telephone rings. Reilly answers.

From the conversation it is apparent to the Sales Manager that Reilly has—as is not uncommon—got another job. Reilly hangs up.

"Well? What now?" asked the Sales Manager.

"Another job," beamed Reilly. "Beats the Dutch how many things a man can get wished on himself if he isn't careful."

"What now? What now?" The Sales Manager was impatient for an explanation.

Doesn't Know What, But He'll Do It

"Chamber of Commerce is going to stage an industrial exposition and wants to have some sort of motor car committee. I don't know just yet what our committee is to do, but I'm on it. Also, I believe I'm chairman of it. Some class, eh?"

"I should say as much!" agreed the Sales Manager. "Some class is right! You can get more jobs, more committee appointments and get mixed up in more limelight than any other one man I ever know! You are absolutely the limit!"

For answer Reilly merely snickered without making any noise—which was an accomplishment in itself.

"I should think it would interfere with your business," asserted the Sales Manager, "all these committees and balls and parades and expositions and shows and every darned old thing that comes along. If you got paid for this work you could afford to throw up the Sennett agency and settle down in luxury for the rest of your natural life—and

even if you don't look it I think you may live quite a while yet."

"Oh, it isn't much," pleaded Reilly, who seemed anxious to defend himself against the factory-made charge of not sticking to business.

"Looks like a lot to me."

"Do I neglect business?" demanded Reilly.

Reilly Whispers a Profound Secret

"No," countered the Sales Manager, now on the defensive, "I should say most assuredly that you do not, but I

"You planned it years ago!" The Sales Manager was mystified. "Why!" he exclaimed, "the exposition was only just thought of this week, according to your story. You——"

Reilly interrupted: "Years and years ago, Jimmy, when I was a young lad and used to peddle papers, I used to see the name of Cornish K. Platt in the papers. He was mixed up in everything, it seemed. I used to wonder if God could make another world without Cornish K. Platt being on the Forest and Stream Committee on the Board of



"I'm the original busy man. And the funny part of it is that the more I find to do the more I seem able to do. Neither does it cut into my business"

should think you would feel imposed upon with all this work dropped onto your shoulders."

"But——" and Reilly leaned over and whispered, although there was no one within eavesdropping distance, "——there's a secret. I really want these jobs."

"Want them!" almost shouted the Sales Manager. "Want them! Reilly you're a nut—n-u-t—nut!"

"Oh, no, I'm not," laughed Reilly. "Far from it! Years and years ago I planned on getting on this Industrial Exposition Motor Car Committee—and my plans have not miscarried."

Namers of Web-footed Monstrosities. I thought he must be some guy! He was, too!

The Man Who Fired His Ambition

"There didn't seem to be a week go by that Cornish K. Platt's name didn't bob up somewhere, and he was always doing something. And everyone else seemed to have the same impression. He was universally known and well thought of—so far as Callawassa was concerned. I made up my mind that it must be a great pleasure to be such a prominent man as Cornish K. Platt and I resolved that when I became a man I would have

my name in the papers and be mixed up in whatever was going on."

"Oh ho!" It was dawning on the Sales Manager.

"When I was young and not wise in business matters I used to look at it purely from the standpoint of pleasure; I am just Irish enough to want to be in the thick of things. But as I grew older and got into business I saw the advantage that might accrue from being a well-known man. I saw that it might be of value to me to be a part of the civic life of Callawassa and take part in her growth, development and activities. Therefore I planned."

"Unselfishly, of course," added the Sales Manager.

His Motive Becomes Unselfish

"Not then, but now—to a certain extent!" shot back the dealer. "I have come to love the work, to love the city, to want to see it grow and be known everywhere. I am still working for Reilly and Reilly's business, but with it all has come a change of attitude. It all is still of value to me, but my motive has become more unselfish than it was."

"Today I would do anything to help along a good cause, even if it didn't get me any publicity, whereas when I started in my object was purely to boost myself—and incidentally my own business. I believe any man who does this will in the end work up a real interest in the work."

"But how did you go about it? You say you planned."

"Yes, I planned," continued Reilly. "When I started in business for myself and had this longing to be one of the men of the town I knew it would be a long road; it was something that couldn't be done in a day. One of the first things I did was to join the Callawassa Citizens' Club, a social organization of the representative people of the town. The membership is limited and I had to get on the waiting list and stay there eighteen months—but I got there."

Carrying Out the Plans He Laid

"And after I got there I proceeded to take advantage of my opportunity. I frequented the club as much as possible without letting it conflict too much with my business or domestic affairs and did my best to become known to and acquainted with the best people in town. I set out about it systematically and actually schemed to meet men whom it would be to my advantage to know. I did quite well at it, too. Membership in the club established a man's standing and this helped. I couldn't have gotten

in without being vouched for by two members of the organization, and that's something in itself."

Worked Like the Devil to Do It

"And then there was the Callawassa Chamber of Commerce; this is made up of everybody who will join, but mostly business and professional men. The organization is always anxious to secure new members and it wasn't at all difficult to arrange to have myself solicited to become a member. And once I joined and was asked to take up some dinky little job with no glory and a lot of work I accepted the appointment and worked like the very devil. I became known as a willing worker, and when there were any more jobs they began to come my way. I got committee appointments and such things and this helped make me known and make my name known in the city and surrounding country."

"The thing works cumulatively, Jim. The more you do the more they want you to do and, in my case anyway, I haven't noticed that there's any lack of appreciation. Of course, people don't come round falling on my neck; they don't have to. I know when I'm appreciated without having the fact inscribed on a parchment and presented to be on a silver tray."

"And then there is the church. I am far from entitled to a crown of glory if I croak the next minute, but I do go to church with some regularity. I think it is a good thing for a man to do. It helps one socially and is only one more of those ways of making yourself known. And it is a good thing for a man, too. It drags him out of the rut of business and world affairs once a week—if he goes that often—and injects into his character a certain element which can be obtained in no other way."

How It Worked in the Long Run

"I agree with you there," was the Sales Manager's sober comment.

"Then there is, of course, the Callawassa Motor Trades Association. I was one of the organizers in this trade movement in town. I saw the benefits that lay in it for all of us, and I worked hard. And, as usual, it brought me somewhat into the limelight. I had to meet all the men in the trade; many of them I called upon personally; I was an officer of our local motor car shows, and I became one of the best known dealers in town."

"All of these things have helped me, Jim; they surely have. I have advertised consistently in the newspapers and my name has been before the public

week after week for years. When the people read the name of Cornelius J. Reilly in a story they don't have to ask who it is; they know. That name has been hung on the tail of so many ads that they can't forget it. I have made it a fixture in the public eye. I am Reilly, the Sennett Dealer, and I don't say it in any spirit of bombast or self-glorification."

"But has it helped you? Really, has it?"

Likes Having His Record Looked Up

"Yes, it has, Jim," responded Reilly with deliberation. "I have played fair and been honest in all this public work of mine and never have I gone in for grandstand work or sought to force myself into the limelight. I have worked hard for what publicity I have secured, and because of the way I have conducted my campaign the public has not only come to know me and know of me, but has come to know me as a reliable man. Everyone knows that Reilly is square. People have no hesitation about dealing with me."

"It would be different if I had gone in to grab the limelight and had played a sharp game; I would have lost out in the end, but as it is I have built upon a more solid foundation and have attained a reputation for reliability. If a man considers buying a Sennett and, before coming to me, he asks about me, he gets an answer that allays any fears he may have as to my financial and moral standing."

"I dare say all that is true, Reilly, and it sounds like one of the most far-reaching and best-laid plans I ever heard of. But what gets me is where you get the time for it all! How do you manage it?"

"Another secret, Jim." Reilly didn't lean over in secrecy this time. "If you want anything done where do you go? To a busy man, don't you?"

"Yes."

Takes a Busy Man to Do Things!

"Well, that's me! I'm the original busy man. And the funny part of it," laughed Reilly, "is that the more I find to do the more I seem to be able to do. If a man asks me to do a thing I always try to find time to do it—and generally I find the time. Neither does it cut into my business."

The Sales Manager reached for his hat. "Would you find time this busy day to go over to Joe Keke's Smoke Shop?"

"Much time!" laughed Reilly, and they started for the door.

Overland Chicago Station Works Out Solution of Problem— Results Are the Kind That Count and Few Mistakes Are Made

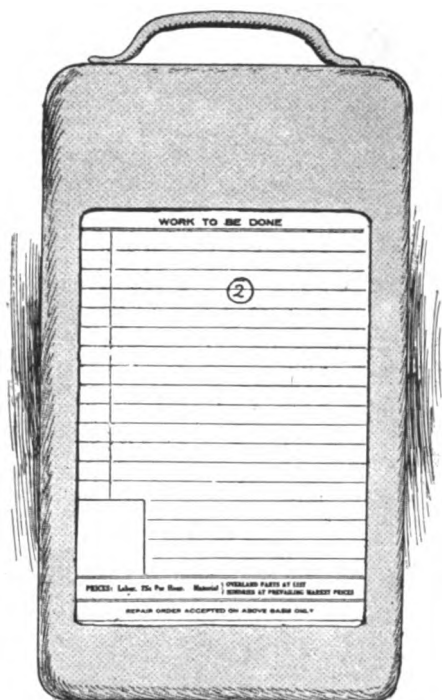


Fig. 2—Leather case with celluloid front; attached to car and carries card with mechanics' records

the mechanic's name is written across the bottom of the white sheet, A.

This sheet is kept on the foreman's desk and the tan card is placed in a leather case, shown in Fig. 2. This case or pocket has a celluloid front and the writing on the card behind it is plainly legible. This pocket is attached to the car and the repairman can tell what work is to be done without handling and soiling the card.

Electric Timing Stamp

As soon as the mechanic receives the card he stamps it in an electric stamping machine, made by the Stromberg Electric Co., Chicago. This machine stamps the date and time on the reverse side of the card. When this mechanic has done all he can to the car he again stamps the card, this time on the line marked "finish." The mechanic's number is also placed in its proper column.

Another mechanic may then receive the car for some special work, for most of the men at the shops are specialists in some line. One may be a good starter man and another a rear axle expert. Each man has the card stamped before he starts and after he finishes his work. Each time a new mechanic gets the job the foreman jots his name down on the white sheet he holds so that if he wants to know how a certain car is progressing he calls the man whose name is on the card. In this way the foreman knows at all times just who is handling a job and just how the work is progressing.

After all the work has been completed

the tan card is handed to the foreman, and this and the white one he holds are sent to Superintendent Nicolet, who gathers them all together and places them in the envelope which is shown in Fig. 1-D.

Filling in the Blank Forms

During the car's stay in the shop should any repair parts be necessary a form shown in Fig. 3 is made out in duplicate. The original is yellow in color and the duplicate pink, with no printed matter upon it except the number. The foreman keeps the pink slip and sends the mechanic to the stock room with the yellow one. Here the stockman, David Andrews, supplies the necessary parts and the mechanic signs the yellow slip.

Upon this slip is placed the cost price and stock distribution, together with the price to be charged to the customer. The stock distribution refers to a particular bin or portion of the stockroom where the material is to be had. These yellow slips are sent to the superintendent as soon as possible, so that a record may be

made upon the envelope shown in Fig. 1-D.

When the job is completed the superintendent holds the envelope within which is the foreman's white card, the tan-colored card, all the yellow supply slips, and on the outside a complete record of the parts, taken from the yellow slips.

Final Disposition of Forms

The car is then turned over to a tester, who, after placing his O. K upon it, attaches to it a special green tag. He places his name and the owner's name upon this tag. Before delivering the car the superintendent inspects the envelope giving a list of the parts supplied. Should the item be small, or the customer exceptionally good, Nicolet stamps the word "Policy" on the envelope, the meaning of which is that he deems it good policy to refrain from charging the customer for such a small item.

If the repair is included in the maker's guarantee the word "Maintenance" is stamped across the envelope, but if the work is to be paid for by the customer,

 This figure shows four overlapping forms from the Overland Motor Co.

- Form 3 (Top):** A requisition form titled "REQUISITION" with the number "A 17800". It includes fields for "TO THE STOREKEEPER", "PLEASE DELIVER THE FOLLOWING MATERIAL AND CHARGE", "TO", "SHIP", "VIA", "ORDER NO.", "BILL NO.", and "JOB 3382". It has a table with columns for "QUANTITY", "DESCRIPTION", "PRICE", "COST", "STOCK DIST.", "PRICE", and "AMOUNT". The entry "1 Rear ax" is written in the table.
- Form 4 (Middle):** An invoice form titled "Overland Motor Co." with address "2426-28 MICHIGAN AVE. CHICAGO". It includes fields for "Telephone Calumet 5500", "Automatic 73407", "Invoice", "Order No.", "Your No.", "Sold to", "VIA", and "Terms Cash".
- Form 5 (Bottom Right):** A monthly statement form titled "OVERLAND MOTOR CO." with address "2426-28 MICHIGAN AVENUE CHICAGO". It includes fields for "To Balance" and "To Date".
- Form 6 (Bottom Left):** A pass form titled "GOOD THIS DATE ONLY" with fields for "PASS", "MODEL", "LICENSE NO.", "WHY GOING OUT", "TIME OUT", "TIME IN", and "OVERLAND MOTOR CO.". It also has a section for "RECEIVED ABOVE CAR" and "SIGNATURE".

Fig. 3—No. 3, requisition for repair parts, is made in duplicate. No. 4 is the bill blank; this also is made in duplicate. No. 5 is the monthly statement, a copy of which is kept in the files, and No. 6 is a pass issued to cars which leave the garage after working hours are over

⑦ ALL ORDERS BY TELEGRAPH OR TELEPHONE MUST BE CONFIRMED ON THIS BLANK

The
Overland
CARS
"Always Ready"

Order No. _____ 191____

When Ship _____

Ship Via _____ Ship to _____

Charges _____ Address _____

Order Entered _____ Charge to _____

Address _____

QUANTITY	PART NO.	DESCRIPTION	PRICE	TOTAL	AMOUNT

This order when placed with The Willys-Overland Company is subject to the terms and conditions printed on the reverse side of this sheet. Should any of the parts mentioned on this order be otherwise used in any other way, the dealer is to be held responsible for the same. No parts are to be returned to the company without a receipt from the dealer. No parts are to be returned to the company without a receipt from the dealer.

Signed _____

For _____

ALL ORDERS FOR PARTS MUST BE MADE ON THIS BLANK AND DATED

Form No. 101 10-1-15

⑧ ORIGINAL

PACKERS' LIST

THE WILLYS-OVERLAND CO.
TOLEDO, OHIO

Shipping Order No. *39791*

We ship to-day *12-23-15*

To *Overland Motor Co.*
2426 Michigan
Chicago Ill.

Via *RA* The following parts to apply on your Order No. *1263-12-15*

2	77823	Synchromizer only	79
2	77822	Starting Motor only	79
6	9984	Fan belt not front end	58
2	10701	Diff. head pinion 3 1/2 to 1	71
6	9197	Prop. shaft	69
4	6604	Valve	79

Signed *Jan 1/15*

Order Filled by *WK* Checked by *Ad* Packed by *EH*

NOTE—IN CASE OF SHORTAGE, PLEASE REPORT AT ONCE, AND REFER TO NUMBER OF THIS MEMORANDUM

Form No. 10-1-15

Fig. 4—When the stock room requires a supply of parts from the factory an order is made out in duplicate on the blank at the left. When the parts are received they are checked against the factory packer's list, on the right, and against a duplicate of the original order

the word "Charge" or "Cash" is stamped.

The car is now ready to be called for by the owner, or delivered to him. The envelope, together with all the blanks previously mentioned, are sent to the billing department, where the account is debited on the ledger and a bill made out. The bill blank is shown in Fig. 3, No. 4, and is duplicated upon an orange sheet. The original is white and is sent immediately to the debtor, if he has not paid cash, the orange sheet being placed

in a loose leaf book. At the end of the month a statement, No. 5, is sent. This also is duplicated for the files.

Two other interesting systems are used. When a car must be delivered after working hours a pass must be obtained from the superintendent, allowing him to remove the vehicle from the premises. The pass is shown in Fig. 3. Such passes are issued whenever a car leaves the floor after hours, so the watchman will know it is being done under orders.

The stockroom receives its supply of parts from the factory, and whenever any are desired a form, shown in Fig. 4, is made out in duplicate. The original is sent to C. H. Chamberlain, the order clerk, for pricing, and the duplicate is kept on file in the stockroom.

When the parts come to the stockroom they are checked first against the list, No. 8, sent by the factory, and then against the duplicate of the original request.

AT THE PHILADELPHIA SHOW THE STUDEBAKER DEALERS DINED TOGETHER



This picture was taken following a luncheon given by the Philadelphia Studebaker branch at the Hotel Walton. In the front row, standing, fourth from the right, his hat in his left hand and broad lapels on his overcoat, is Vice-president and Sales Manager E. R. Benson of the Studebaker Corporation, Detroit

WIDE-AWAKE MERCHANDISING

LEARN SALES TRUTHS FROM A MAP

What Territory Was Missed
and What Has Been Covered?

VISUALIZE YOUR WHOLE WORK FIELD

Visualize your sales records. You will learn some astonishing facts.

This does not mean to be content with getting your facts into figures. That is the regular thing; everybody does it. And frequently when you get through looking at them they are just figures—nothing more.

One of the best helps the factory sales manager has is the sales map. This shows the entire country. It is usually lined off into territories. Looking at it you will be forcibly reminded of a war map. For there are usually green, red and blue pegs scattered all over it. These pegs tell a story. They save time looking up records. They show at a glance where weakness exists and where strength is apparent.

The dealer with a territory can, with a blue and red pencil and a large map of his counties, get precisely the same result. The dealer with a city of any size to work will find a similar map just as helpful. You know the question a good sales manager asks himself is not just "Am I selling enough cars to make a profit?" He builds for the future as well as the present and tries to distribute the product strategically so that this year's work will help materialize next year's plans.

A certain dealer who had just been talking to the factory sales manager saw him consult his maps and he got an idea. He stopped on the way back to his office and bought a big city map. Then he looked up the address of every purchaser to whom he had sold a car during the past season. He made a grouping of each lot into four classifications, "North,"

"East," "South" and "West," and he was very much astonished to find that the bulk of his sales had been in the east end of the city. A fair amount of work had been done in the north end, but practically no sales had been made to people in the western and southern portions.

At once he put on a man to develop West End business. Today they have many cars in the western part of the city. For it was plainly apparent that where he had customers he was getting trade. Where he had none he had no trade. That sounds a little foolish perhaps and perfectly obvious, but nevertheless it is one of the truths that many dealers do not realize. Or if they do realize it they do not have it before

them in such shape that it makes an impression.

Think it over.

Lay out a map for your territory and for your own town—see what it looks like when you get it divided off and the figures down. You will learn much that is of importance in sales development.

PUBLICITY STUNT THAT GOT ACROSS

**This Iowa Studebaker Dealer Adopted a
Method That Caught the Public's Eye**

This publicity method was employed by E. A. Christiansen, Studebaker dealer in Sioux City, Ia., who rigged it up for use during the Sioux City fair. The motive power, as the sign on the hood plainly states, is derived from a standard Studebaker-Wagner electrical system, using the regular three-cell Willard battery.

Though the basis of the car was merely a stout cart with small, steel-tired wheels, the miniature motor car would develop a speed of 15 miles an hour and would run for 30 miles on one charge.

The driver is Mr. Christiansen's son.



This little car, which was used during the Sioux City fair by E. A. Christiansen, Studebaker dealer, was run by a Studebaker-Wagner starting motor and battery

DEALER HELPS FOR SELLING

Brake Lining Marked and Displayed Effectively

There is a decided tendency among accessory manufacturers toward a more thorough cooperation with dealers. A number of manufacturers are now furnishing special sales helps and in many ways are showing that they recognize the importance of the dealer as a factor in the building up of their business. The live dealer is interested first, of course, in the quality of the lines he handles.

Satisfied Customers the Best Ads

A permanent business can only be built on good will as a first foundation, and this foundation must be cemented with good service. It is an old truism, but very apt nevertheless, that "Your best ad is a satisfied customer." The Standard Woven Fabric Co. is among the more prominent accessory makers who are alive to the good advertising of satisfied customers and are offering a special sales service to their dealers and in turn enabling these dealers to give good service.

In making its plans for the year, this company was confronted with a difficult task. Brake lining at best has been a clumsy stock to handle and the dealer has considered it in the nature of a necessary evil and been reconciled to it only on account of the profit to be gained in the turnover of the stock. The profit is in no way lessened by the company's new dealer policy—rather it is increased if anything. At the same time, Multibestos is transferred from the back corner to a prominent display position.

Sales Cabinets Built in Sections

This is brought about by the use of the Multibestos stock cabinet or "Automatic Salesman." The cabinet is furnished to those dealers who carry a stock of Multibestos and, being in sections, can be made to carry a stock of any size.

There are seven separate compartments in each section and in each compartment is a separate axis on which the roll revolves. To facilitate the measuring of the stock when filling orders, Multibestos is marked with white lines across its surface at intervals of 1 foot. As a popular phrase, these are styled, "White Foot Prints Leading to Satisfaction in Brake Lining."

By means of these white marks the dealer can tell at a glance the desired

amount of brake lining required on any order and can cut it off and make his sale as easily as with any other articles he carries in stock.

CLEANLINESS MEANS THRIFT; DIRT MEANS INCOMPETENCE

DIRT IS ALWAYS ASSOCIATED WITH FAILURE. NEVER WITH SUCCESS.

The scrub brush and pail and the cleansing mop are the signs of the good storekeeper as they are of the good housekeeper. It isn't that dirt in itself is so bad. It is the things that dirt stands for. Cleanliness stands for thrift, for energy, for work; dirt for incompetence, laziness, shiftlessness.

And there is this to be said. Always the man with the pail gets his cue from the man above. If he knows the boss is particular, exacting, careful, thorough, he is likely to do his work well; because, if he doesn't he knows he will have to endure doing it again and perhaps he will get fired in the bargain.

Boss Wonders What's the Matter

On the other hand, you can easily tell when the boss is lax. Look into the corners for dirt. See the spots. See the dirt on walls and doors. See the papers behind desks. See the junk in the corners of the garage. See the boss himself wondering why he doesn't make money.

Who would believe that so many good things could start from cleanliness! So many bad, untoward things start from dirt! And yet the history of a city, the history of an individual, the history of a business is written in terms of dirt or cleanliness.

EUROPEAN WAR MADE TO HELP

Buick Dealer Uses It as a Magnet to Draw Trade

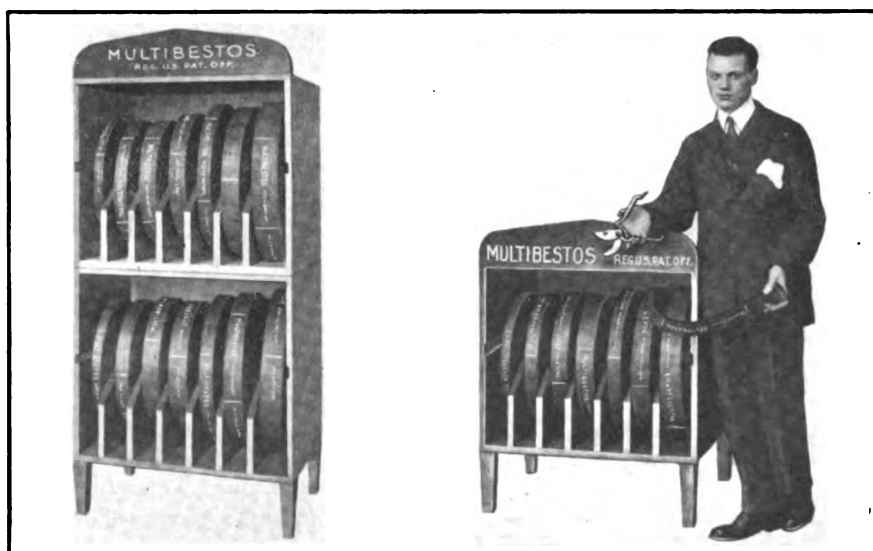
The Norfolk Buick Motor Car Co., Norfolk, Va., has brought the European war into its selling plans; it is advertising that it will donate \$50 on each sale, made under certain conditions, to such charity or relief work as may be designated. The plan has been in operation but a short time and Secretary Victor de Murguiondo states that it is as yet early to prognosticate results. The plan is explained in an ad. which states:

\$50 to Charity for Each Car Sold

"The Norfolk Buick Motor Co., desiring to help in the grand work that is being done for the Belgians and Red Cross Society, as well as other charitable and relief associations, submits the following proposition. To anyone sending to the company a purchaser of one of their cars, they will donate \$50 cash of the purchase price of said car, to be used as they may desire.

"Party sending purchaser does not have to do the selling; the Buick people only ask the name of purchaser or send said purchaser to them and they will do the selling and demonstrating."

To give every man who enters the salesroom as much attention as he requires, without worrying him with too much, should be the dealer's aim. The distinction is rather a nice one, but it is one of the little things that count.

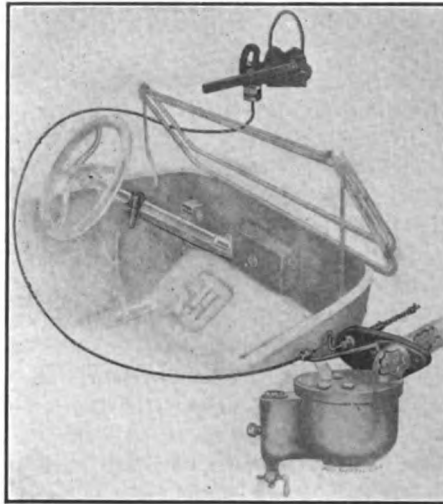


The manufacturers of Multibestos furnish sectional cabinets to dealers who carry stocks. White lines mark the brake lining at one-foot intervals

RECENT DEVELOPMENTS in ACCESSORIES

Schrader Quick-Acting Valve Cap

A valve dust-cap that can be put on and removed without the usual tedious screwing down and up is a recent product of A. Schrader's Son, Inc., Brooklyn, N. Y. Quick action is secured by splitting the threaded section, which screws on the valve stem, into four parts which normally expand so that the opening is larger than the valve stem. To put the cap on it is slipped over the stem and pressed against the rim nut, which causes the threaded sections to contract and form a continuous thread; a quarter turn tightens it in place. Removal requires merely a quarter turn in the reverse direction, when the cap can be slipped off. The caps are usually sold in sets of five—one for each wheel and one for the spare—at \$2; single caps, 40 cents each.

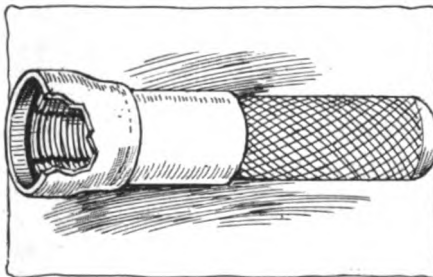


This device admits more air directly into the intake in a stream at high velocity and is intended to assist carburation

Double Springs in Ford Shock Absorber

A new type of shock absorbing auxiliary spring for Ford cars and selling for the unusually low price of \$8 per set of four or \$4.50 per pair, has been placed on the market by the Cox Brass Mfg. Co., Albany, N. Y. The device is of the type which takes the place of the usual spring shackle bolts. The construction is simple, and yet is different from the usual device of the kind. Within a slotted spring cage there are two finely tempered helical steel springs, one within the other, and wound in opposite directions. One of these springs, the heavier of the two, supports the vehicle and cushions the heavier jars. The second

spring acts in an auxiliary capacity to the first; furthermore, there is a spur which comes into action following a severe re-



The Schrader quick-acting valve cap has a sliding sleeve which brings a slotted threaded section together around the threads

bound and causes both springs to be brought into action at once to their full capacity. There is a nut at the top, by means of which the tension of the springs can be varied to suit the individual Ford car. The shock absorbers can be installed, it is stated, in less than one hour and there is no need for removing the wheels.

Nyco Auxiliary Air Valve

A device designed to improve the quality of the mixture produced by the Ford carburetor is manufactured by the New York Coil Co., Inc., New York. It is controlled from the dashboard by a Bowden wire and is easily installed with the aid of no tools other than a wrench.

The valve proper is built into a flange

which is bolted between the carburetor and the flange of the intake manifold. A sliding rod attached to the valve is pulled out by the Bowden wire and returned by a helical spring. When the valve is open the extra air is shot forcibly into the stream of gas in the intake pipe, breaking up the particles of fuel and at the same time adding the air necessary to produce complete combustion.

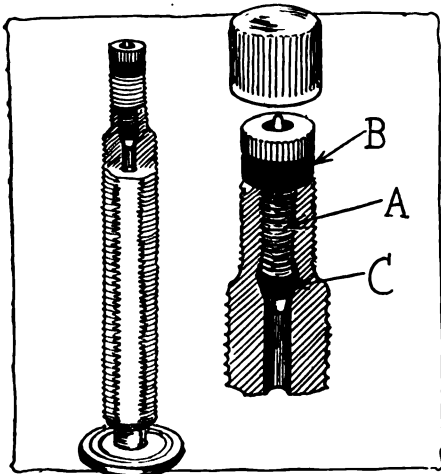
Either hand or foot control may be used. In the case of hand control there is a small lever on the steering column under the wheel with a locking screw working through a sector slot to hold any desired opening. A pedal is supplied for foot control. The price of the complete outfit with pedal is \$5 and with hand control \$6.

Double Seal Tire Valve

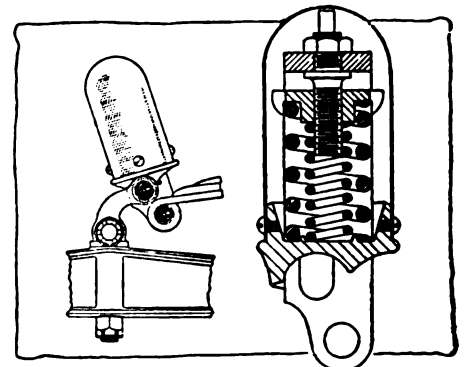
The Double Seal Tire Valve Co., Inc., with offices at 1790 Broadway, New York, will manufacture and market a new tire valve for which it possesses the sole rights.

The feature of the valve is the simplicity of the insides, which are interchangeable with those of the ordinary tire valve. The details are shown in the accompanying drawing. A hollow plug, A, screws into the outer end of the stem, having an exterior milled head to make its insertion and removal easy. The double seal feature consists of two rubber gaskets, one, B, under the milled head and the other, C, in the tapered inner seat. These form a joint that is secure against leakage.

The valve proper is inside the hollow plug. It is a simple rubber-seated valve



Springs are eliminated in this tire valve, the air pressure keeping the valve closed; there are two seals, B and C



Double springs are used in the Cox shock absorber for Fords

without a spring, the pressure of the air within the tire being relied upon to cause seating, while the pressure from the pump in inflating unseats the valve in the usual way. The advantage claimed for this arrangement is that there is no pressure against the pump except that of the air itself, making the work considerable easier than when pumping

against a spring, as well as simplifying the valve. The stem of the inside valve projects through the milled head, permitting the deflation of the tire without poking anything into the valve.

A plain, rounded dust cap is used; this is an advantage when a tube is folded, as there is nothing on the cap to injure the rubber.

Hydrometers for Testing Fuel and Acid

Plenty of variety in form and size and wide range of prices

Tagliabue's Extensive Line

Hydrometers for testing electrolyte, gasoline and non-freezing cooling solutions are manufactured by the C. J. Tagliabue Mfg. Co., New York. A hydrometer and syringe combined is made in two grades; the standard grade has a heavy glass tube body with a rubber syringe bulb at one end and a glass tip on a flexible rubber tube at the other, the hydrometer proper being in the tube. The tip is inserted in the battery cell and sufficient liquid drawn out to float the hydrometer, from which the specific gravity can be read and the liquid returned to the cell. The ends of the glass tube are ground to ensure a good fit of the rubber end fittings which carry the bulb and tip. Range, 1100 to 1350 specific gravity. All parts are easily removable for cleaning and renewal. The price is \$56 per dozen.

A medium grade instrument of the same kind has the bulb and rubber tip attached directly to necks formed on the

ends of the body tube. The range is the same and the price is \$28 per dozen.

Plain hydrometers—that is, hydrometers not enclosed in syringe tubes—are made in five models, all intended to be floated in liquid drawn from the battery cells and put into a test tube or glass by means of a separate syringe. The standard grade is about 6 inches long and consists of a glass tube closed at both ends and having a long neck of small diameter rising from a body of much greater diameter; the lower part is weighted to make it float at the proper height and the upper part or neck is graduated for specific gravity. The reading is taken at the point where the scale is touched by the surface of the liquid being tested. The scale is marked in 5-degree intervals and the range is from 1100 to 1350. The price is \$240 per gross.

The Newbrook grade instrument, of the same type, is 4½ inches long, has the same range with 10-degree intervals

and is put up in a wood box with glass jar. Price, \$144 per gross.

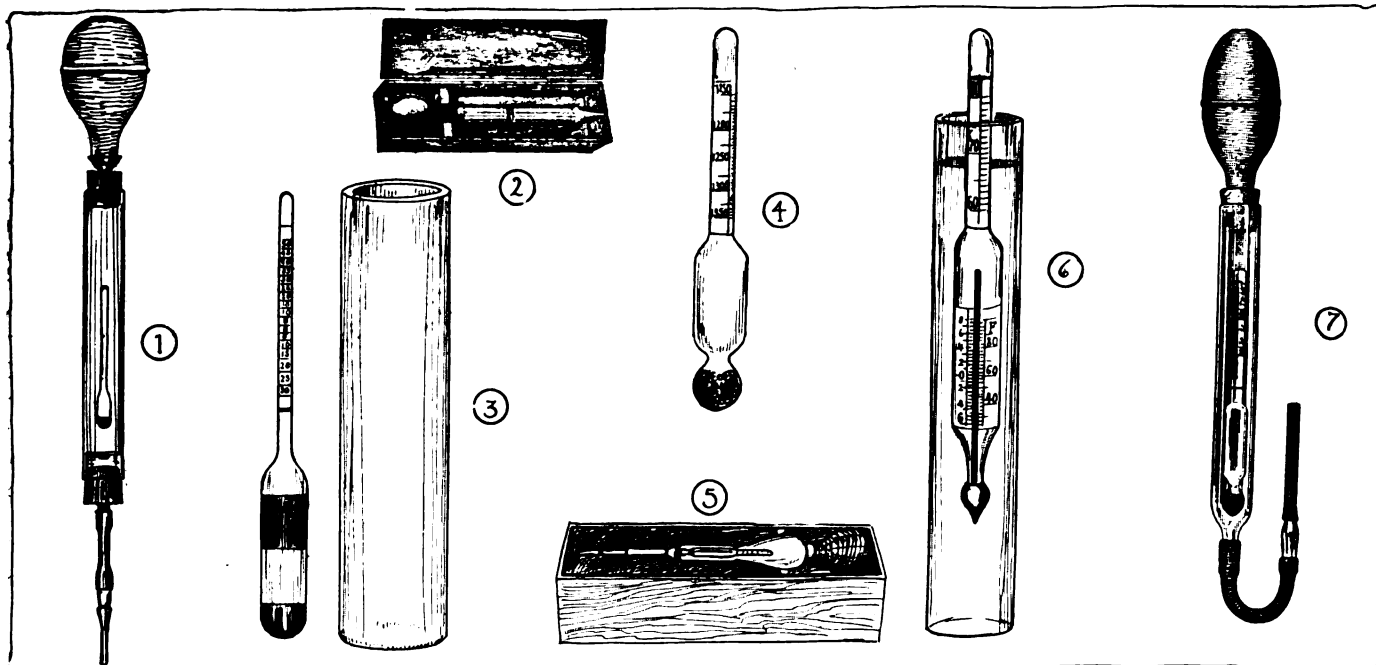
Three models are made at a still lower price—\$128 per gross. No. 5 is 5½ inches long, range 1100 to 1350 with 5-degree intervals, and is packed in wood box with flannel bag and glass jar. No. 6 is the same but the range is 10 to 40 by 1-degree intervals and the Beaume scale is used. No. 7 is 4½ inches long and has a flattened body so that it can be used in narrow places in cells.

Gasoline hydrometers are made in three models. No. 8 incorporates a thermometer in its body tube, is 5 inches long, reads from 60 to 80 Beaume by 1-degree graduations and is packed in nickel case with glass jar and flannel bag; price, \$336 per gross. No. 9 answers the same general description but is smaller and has no thermometer; it is packed in the same way and the price is \$144 per gross.

At a still lower price there is No. 10, having the same range and graduation intervals and packed in wood box with glass jar and flannel bag; price, \$80 per gross. A convenient hydrometer for those who use water-alcohol non-freezing solutions is so graduated that the scale reading shows the freezing point of the liquid under test. It is called the Kno-freeze-meter and is put up in a box with glass jar at \$19.20 per dozen. Dealers, 1 gross, 50 and 25 per cent.

Hydrometer With Glass Guide

A feature of the syringe hydrometer manufactured by the American Thermo-Ware Co., New York, is that the hydro-



Some of the many forms in which hydrometers are made—1, Tagliabue instrument with flexible tip. 2, Autocrat, in which hydrometer cannot touch syringe tube. 3, Tagliabue's Kno-freeze tester for radiator solutions. 4, Gen. Scientific Equipment Co.'s moderate priced acid tester. 5, Edelman's boxed acid tester; hydrometer removable from syringe. 6, Tagliabue's gasoline tester with thermometer. 7, Weinhausen's acid hydrometer, which shows full charge and exhausted battery by red lines

meter is guided in the syringe body, which is of glass, so that it cannot touch the sides and impair the accuracy of the reading. The Autocrat instrument, which embodies this construction, is a large one, being 19 inches long with the nozzle attached; it is put up in a polished hardwood box with hinged cover, the box being designed for hanging on the wall. The hydrometer is marked in Beaume and specific gravity scales, ranges 10 to 40 and 1100 to 1350 respectively. With the nozzle removed the instrument is considerably shortened; the containing box is 12 inches long and 3½ inches square. The price is \$4.

A less expensive instrument is made at \$2; it does not have the hydrometer guide or the polished wood case; it has both Beaume and specific gravity scales and is put up in a cardboard box. Another model is a combined hydrometer and thermometer for testing gasoline; prices range from 75 cents to \$1.50 and the same instrument is made for battery testing. Anti-freezing solution hydrometer in wood box, \$1.25; in nickel case, \$2.

Facilitates Hydrometer Readings

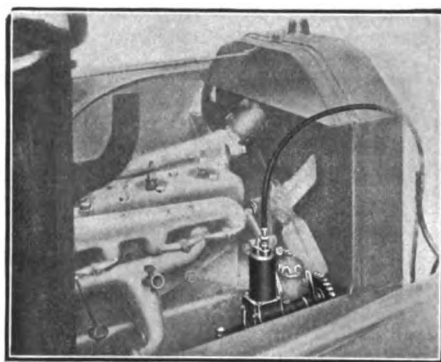
A battery hydrometer in which the points on the scale indicating full charge and exhausted battery are marked in red is manufactured by Henry Weinhausen, New York. The instrument consists of a glass-bodied syringe containing the hydrometer; the syringe tip is of flexible rubber. The instrument is packed in a box with printed instructions for using. Price, \$1.50 each; \$10 per dozen. A combined gasoline hydrometer and thermometer is made which sells for \$18 per dozen; each instrument is packed in a round wood box with glass test jar. The same instrument without the thermometer costs \$3.50 per dozen. Flat battery hydrometers, \$7.50 per dozen. Non-freezing solution hydrometer has a thermometer so that the reading can be taken at the proper temperature. Price, \$18 per dozen. Each hydrometer is packed in a wood box with a glass test jar. Dealers, 40 per cent.

Hydrometers in Various Styles

The General Scientific Equipment Co., Philadelphia, makes hydrometers for testing battery electrolyte, gasoline and non-freezing solutions. Type A-1, standard grade, is of the type in which the hydrometer is enclosed in the glass body of the syringe. The instrument is packed in a wood box; price, \$21.60 per dozen. Parts: Extra bulbs, 50 cents each; glass tubes, 50 cents; hydrometers,

\$1, and nozzle and plug, 25 cents. Type B-2 has a straight heavy glass tube body with the bulb and nozzle in rubber end fittings and the hydrometer in the body tube. The graduations read from 1100 to 1350 specific gravity. Each instrument is packed in a wood box. Price, \$48 per dozen.

Separate hydrometers are made in two grades; in each case the instrument is 4½ inches long and is packed in a wood box with flannel bag and glass jar. No. 100, \$12 per dozen; No. 101, \$6 per dozen. Gasoline hydrometers are made in four models. No. 102, pocket size, 6 inches long, has Beaume scale reading from 60 to 80 degrees by 1 degree intervals and has thermometer and a cor-



New Kellogg engine-driven tire pump for Fords.
It is of all-metal construction

rection scale for temperature; it is packed in a nickel case with glass jar and flannel bag. The price is \$24 per dozen or, in wood box, \$18 per dozen. No. 103, gasoline hydrometer, Beaume scale 40 to 90 by 1 degree graduations, is 10 inches long over all; has no test jar. Packed in round wood box; price, \$6 per dozen. No. 104 is another pocket size instrument 5 inches long and is packed in a wood box with test jar. Price, \$6 per dozen. No. 105 is a 10-inch instrument and is weighted with mercury, all the others being weighted with shot. The Beaume scale reads from 40 to 90 in 1 degree graduations. Packed in round wood box; price, \$36 per dozen.

Gasoline and Acid Hydrometers

Both gasoline and electrolyte hydrometers are manufactured by E. Edelmann & Co., Chicago. The largest battery instrument is of the type in which the hydrometer proper is enclosed in the glass tube of the syringe. The bulb is of large size, of red rubber, and the hydrometer can be removed from the tube when not in use so that it will not be broken by rattling around. The outfit is packed in a neat wood box with instructions for its use. The price is \$2.

A lower-priced instrument is made for 35 cents; the hydrometer is used with a separate glass test jar and the outfit is put up in a wood box. A similar instrument for testing gasoline costs 30 cents. Another model is a combined hydrometer and thermometer for testing gasoline; a temperature-correcting scale also is used. This set is packed with glass jar and flannel bag at \$1. A set for battery testing is made at the same price.

Kellogg Power-Driven Ford Pump

An engine-driven tire pump for Ford cars that can be installed in about half an hour without any drilling or other machine work has been developed by the Kellogg Mfg. Co., Rochester, N. Y. The pump has a single cylinder and is gear driven from the camshaft; a special timer case which is furnished with the pump replaces the one on the car. Gears are chamfered so that they can be engaged while the motor is running. The cylinder is of cast iron, the piston has steel rings and the crankshaft is a steel forging. A long hose and a pressure gauge are supplied. The price is \$9.50.

Strenuous Test of Puncture Cure

A semi-fluid puncture sealing compound, manufactured by the Puncturemend Co., Cleveland, O., recently was tested by the Automobile Club of America, New York. Two new tires, one on a front and the other on a rear wheel of a 3,500-pound car, were treated with the composition, three pints being injected into each. Eight nails were then driven into each tire. The nails were immediately withdrawn from the front tire and the compound allowed to seal the holes, while those in the rear tire were allowed to remain. After standing 15 hours the front tire had lost 25 pounds of the original pressure of 80 pounds, while the rear tire had lost none of its 63 pounds. The front tire pressure was restored and the car was driven to Bridgeport, Conn., 56.8 miles, at an average speed of 21.3 miles an hour; the rear tire showed no loss of pressure while the front tire lost 4 pounds.

Three large and two small nails were then removed from the rear tire; but the large holes allowed the air to escape and the nails were replaced, the smaller holes being automatically sealed by the compound. The tire was reinflated to 70 pounds and the return trip was made at an average speed of 20.8 miles a hour. The front tire pressure dropped 6 pounds and the rear 31 pounds. The car was locked up for 14 hours and the pressure again tested; the front tire had lost no air, while the rear tire lost 3 pounds.

Advanced Maintenance

MAKING MANIFOLDS

By George Fernwell

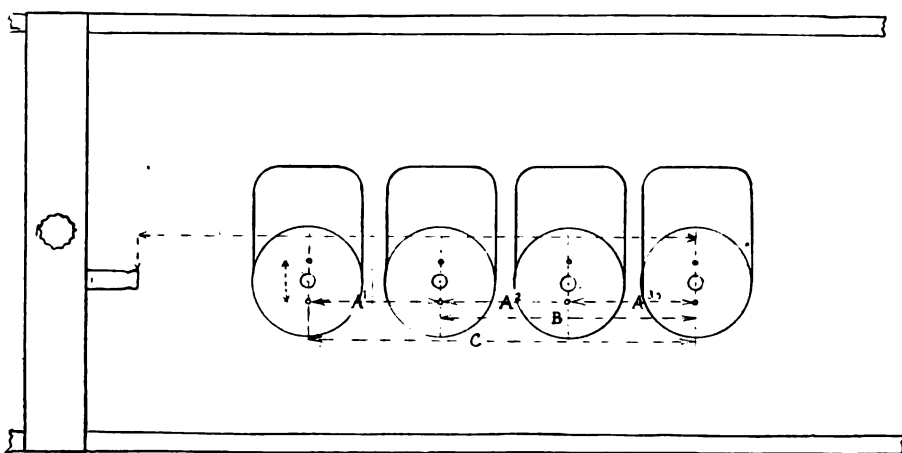


Fig. 1—To avoid subsequent trouble, when making manifolds extreme pains should be taken to obtain accurate measurements. In measuring from A^1 to A^2 and A^3 exactness is required. Measurements B and C can be used as checks

In making new copper pipe manifolds to replace broken or missing manifolds, it is well to take extreme pains to take the necessary measurements with a close degree of accuracy.

Especially does this apply to manifolds having more than two branch connections. Taking only approximate measurements, coupled with constructing the manifold so as to only roughly conform with the approximate dimensions, usually results in considerable waste labor in filing the bolt holes in the flanges and having to twist one or more branches or the completed manifold before the latter can be fitted in place on the motor.

Limit of Accuracy 1/64th Inch

In other words, in measuring for a new manifold the distance between centers of two adjacent studs on the motor casting or between two adjacent machined flange-connecting surfaces or flange seats at different parts of the motor casting or otherwise separate water jackets, should be measured at least as closely as to the 1/64 of an inch. (A^1 , A^2 , A^3 , Fig. 1.)

In the case of a water pipe manifold which is to be made with four branches, each to be connected by a brazed flange to one of four separate water jackets, not only should the distances between

each adjacent flange seat be measured as closely as indicated above, but as a check on even such closeness of measurement the distance should also be taken from either the forward or rearward water jacket flange seat as a base to the third and fourth water jacket respectively. See B and C, Fig. 1.

In making quantities of manifolds for the same model of motor, more or less elaborate jigs would be made upon which each manifold in turn would be assembled and brazed so as to ensure all the manifolds being interchangeable.

Obviously in constructing one mani-

fold only, the labor and expense of making a carefully laid out and machined assembling and brazing jig would involve so much labor and expense as to be impractical.

However, there is room for the exercise of the ingenuity of the workman in planning a simply and inexpensively made jig which would serve the purpose of holding the various flanges in their correct relative position while brazing the branches to the main pipe and also the flanges to the extreme ends of the branches.

The simply and cheaply made device shown in Fig. 2 has the merit of being adaptable for use in making manifolds of varying relative dimensions between the flanges, although as shown it positively cannot be used in all cases without adapting it.

Constructing a Simple Type of Jig

A device made on the general principles of that outlined in Fig. 2 forms a combined adjustable template and assembling and brazing jig. It may be constructed roughly and simply without greatly interfering with its effective use as a means of insuring that the manifold with its branches and flanges when permanently brazed together will fit perfectly in its place on the motor without having to file bolt holes in the flanges

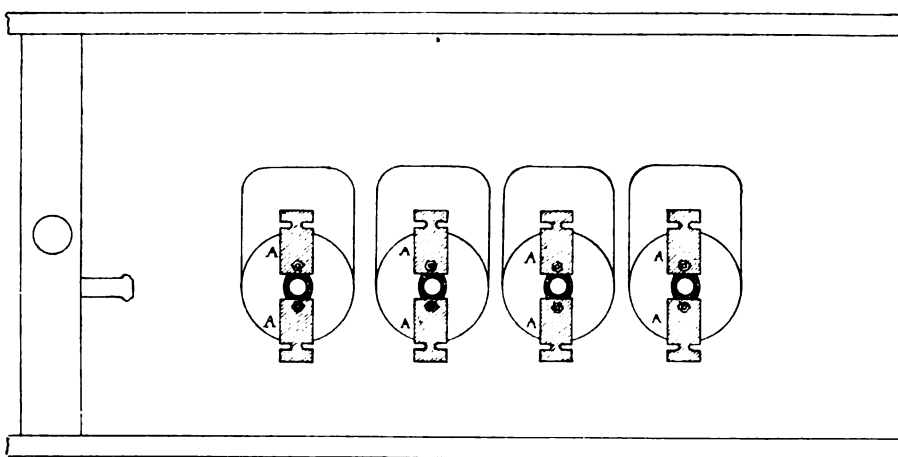


Fig. 2—This shows the first steps employed in making use of a combination template for manifold work. The individual plates, A, are first clamped securely to the water jackets. The plates are made from pieces of steel plate

or twist the branches or distort the main pipe.

Its use as an adjustable template eliminates all need for taking measurements for the purpose of locating the relative position of the respective flanges on the manifold.

For this use the separate flat pieces of steel A, Fig. 2, would be first clamped in place on the water jacket by means of the studs and nuts provided for attaching the manifold. The side rails or bars of the jig would then be clamped to all the steel plates marked A, as in Fig. 3.

Making the Jig Adjustable

To adapt the device for any particular make of motor it might become necessary to fit the side rails to the place marked A, or to make plates in a different form to the "A" plates. It is better to file the jig, however, if it should be necessary in a particular case, than to have to file the bolt holes or twist the branches or main pipe of the completed manifold.

Instances of the latter have occurred in which the area of the water passages were blocked off from 10 to 25 per cent due to the relative mis-location of adjacent flanges on the manifold.

With the side rails clamped to the plates A, the holding down nuts may be removed and the entire template or jig lifted from the motor.

Before proceeding to use the jig for the purpose of assembling the manifold and branches the entire series of bolt holes, of which the jig would be a template, should be marked through the holes in the plates A on a piece of sheet metal or a board or cardboard, so as to be able to tell at any time if any part of the template has been disturbed, by accident or otherwise. This latter precaution would be especially advisable in case the motor should not be accessible during the course of constructing the manifold.

Work That Requires Little Skill

A feature of the combined template and construction jig made on lines similar to that illustrated, which should recommend itself to a practical repair man, is that practically the entire work of making it can be accomplished by the youngest helper or apprentice, the cost of whose time is necessarily inconsiderable compared with that of a skilled machinist.

Effective use of the combination template and jig can be made to insure that the branches will be brazed to the main pipe of the manifold in exactly the prop-

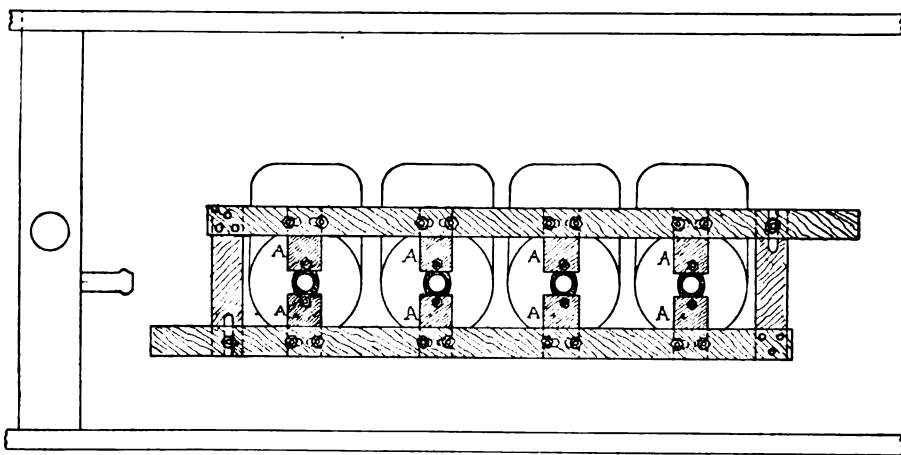


Fig. 3—The next step is to bolt the wood side rails to the steel plates A, using two bolts to each plate. When this is properly done the template, as a whole, may be removed from the cylinder heads by loosening the clamping studs

er position to permit the flanges to be accurately located with relation to each other and their corresponding flange seats on the motor.

Assuming that it is required to make a new manifold and either close measurements have been taken or that it has been decided to be worth while to make the template jig, the next thing to discuss would be the subject of bending it where required without the pipe flattening at the bend. Fine, sharp, white sand, pure soft lead, or rosin are the materials mostly used for filling.

Methods of Bending Copper Pipe

Sand may be used for loading copper tubes for bending for practically all diameters of copper tubing, providing the wall of the tube is not less in thickness than 1/30 of the diameter of the tubing.

The use of sand, however, requires that the pipe be heated for bending; therefore, this method would prove wasteful of time and labor with all but larger diameters of pipe. There is not much to choose between using rosin or soft lead. Rosin is used considerably for very light gauge tubing. Soft lead, however, is preferable for repair-shop purposes, as with it it is possible to make intricate or compound curves and also curves of the smallest practical radius. In addition, soft lead filling is preferable for the purpose of keeping such wrinkles as may form in the process of making bends from becoming too pronounced.

In filling copper pipes with sand the same detailed description applies as in the case of filling and bending steel exhaust pipes, discussed recently in *Motor World*.

The main precautions to take when using sand follow: Use clean, sharp, white gritty sand. See that it is perfectly dry and also that it is free from all particles of wood or other matter

which would burn when the pipe was heated and cause the sand to loosen up from its essentially tightly packed condition. Fill the pipe with sand a little at a time, alternating with shaking the sand well down in the pipe by rapping the latter with a hammer handle.

The use of rosin for filling pipes to be bent requires that the pipe be heated its entire length to at least the temperature of melted rosin, to ensure that the rosin will not be chilled as it comes in contact with the walls of the tube.

After the pipe is apparently full of melted rosin, a blow pipe flame may be applied along the length of the tube to ensure that the rosin runs well down in the pipe so that it will be solid when cooled.

Making Bends in Long Pipes

When the latter has taken place and before proceeding to bend the pipe the rosin should be examined for hollow cores which may have formed in the center of the rosin in the course of cooling. If these occur the pipe must be reheated along its entire length until the rosin is fully remelted and then more melted rosin may be added.

The use of lead for purposes of filling pipes to be bent requires that the lead preferably be pure soft lead; that is, free from other metals, and also thoroughly cleaned from dross or impurities when fully melted and before pouring.

In the case of a pipe of considerable length, say 3 feet or longer, requiring to have made one bend only, near one end, it is of course not necessary to fill the entire pipe with either rosin or lead, but it is necessary, however, to use sufficient rosin or lead to partly fill the pipe so that the filling extends at least 3 inches at and beyond each end of the portion to be bent.

(To be continued)



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Chicago Show Tempest

ALL is not quiet this week on Lake Michigan. Since the opening of the Coliseum show Saturday night there have been many troublesome rumblings, rumblings very distracting to not a few dealers. Telegrams are pouring into the Chicago hotel addresses of several exhibitors, who have something new to offer, these coming from agents on the Pacific coast, others in the South, others in the Southeast and from staid New England. In some cases a reduction in the list price of certain cars has precipitated a real stir; with others the display of a new eight has proved the center of disturbance; but no matter what the reason, it still remains a fact that there is more disturbance among dealers and makers during the present Chicago show than during any previous one for several years.

Disturbance Caused by Eights

More dealers will be in the Windy City this year than in past seasons. They are all anxious about the eight, to know just how the Chicago public is taking it and if the makers are really serious concerning it.

There is good reason why it should create real worry. Many makers are on the fence. Will the eight displace the six? How much more will the price of the medium sixes be reduced? Can makers continue to give quality and reduce prices to meet the vortex that is being created week by week? These are really serious questions. They are questions that not a maker has as yet answered to his entire satis-

faction. Hosts of dealers are trying to answer but cannot.

Rumors of eights are filling the air. One maker announces that he can build an eight so much lighter than a six; another tells how he can build the eight so much cheaper than the six; and so the story goes. In the meantime dealers are doing the only sane thing, namely, sitting tight and bending every effort to get the true estimate of the eight from the public.

Ready, But Not Pushing

Not a few makers, who are not announcing eights, have them well under way and may not announce them unless in a month or so the trend of events makes it necessary. These makers do not want to lend their names to the movement to accelerate the present stampede; neither do they want to be caught napping trying to sell other models when eights may be in demand. Their policy is to get the eight ready, get ready for production if necessary, but make no announcement until the time is ripe, and if that time does not arrive, keep the eight under cover.

National Used-Car Market

CHICAGO enterprise is to be congratulated on its stalwart effort to nationalize the Central Used-Car Market Reports which the Chicago Automobile Dealers' Association has been issuing quarterly for several months. Already several dealers' associations have united in this movement and this week is witnessing more concentration during the Coliseum show. The movement is making commendable progress, partly due to this being the psychological time to accelerate the movement. It is hard selling used cars, harder today than it was a year ago. Every time some maker reduces the price on his car \$300 or \$400 the used-car market in that field is hard hit. Dealers who have been trading on too long allowances cannot exist in such times.

The used-car market reports when generally adopted will have such an influence. Many a dealer is not competent to appraise several makes of used cars and the market reports will teach him sanity in this regard. They will inject sanity into the buyer.

Illustrate a case as follows: Mr. A with a used car on hand to trade in finds that Dealer No. 1 will only allow \$450 for it. The central market report is shown him. Not content, he calls on Dealer No. 2, who, on consulting his market report, quotes approximately the same price and can back up his estimate by the market report. Mr. Buyer soon discovers that he cannot get any fictitious price for his old car. He is brought up face to face with real figures, figures at which these used cars sell. They are not estimates, they are not appraisements, but real convincing figures, figures showing actual sales of the last three months. Herein lies the value of such reports, and if made national in their scope, this influence would be correspondingly increased.

DETROIT'S SHOW BRINGS RECORD DEALER BUSINESS

**Sales of Both Pleasure and Commercial
Vehicles Range from 10 to 50 Per
Cent Better Than Last Year**

—Bright Prospects

Despite the fact that the Detroit motor car show, which ended its week's run on Saturday night last, was held at a considerable distance from the center of the city, dealers state that it was highly successful from a business standpoint; sales are reported from 10 to 50 per cent ahead of last year's show sales. In fact, the show is considered the most successful Detroit has held by C. C. Starkweather, president of the Detroit Automobile Dealers' Association and manager of the Detroit Buick branch.

Commercial vehicle dealers shared in the good business and sales were unexpectedly good. It is reported that about 100 trucks of all kinds were sold.

Dealers were present in large numbers, one hotel reporting 150 dealers registered and others smaller but considerable numbers. They came from all over the country, including Oklahoma, Kansas, Missouri, Pennsylvania, the Carolinas, Tennessee and other distant states. Considerable importance is attached to Detroit's advantage because of its central location as regards the motor car manufacturing industry.

L. J. Robinson, of the Bemb-Robinson Co., Detroit Hudson distributors, states that though the 1914 show was a good one for his company, the one just closed was 33 per cent better. The Detroit Cadillac branch manager states that his house has sold all the cars it can get from the factory, and that interest in eight-cylinder motors is keen even when it comes to buying. Overlands sold better than last year to the extent of 25 per cent. J. C. Ayers, of the General Motors Truck Co., who had charge of the commercial vehicle section, states that fully 50 per cent more business men showed interest in commercial vehicles than at the previous exhibition.

Grand Rapids Men Band Together

More than 50 Grand Rapids, Mich., automobile and accessory dealers, garage owners and tire repair men have organized the Grand Rapids Automobile and Accessory Dealers Association. W. D. Vandercar was elected president; Carl P. Palmer, vice-president; Earl R. Corbin, secretary; Floyd G. Withrow, treas-

urer. The directors are Lafe Phelps, Ray Becker, William F. Calrow, Glenn R. Austin, Frank Dean, F. W. Kehlet, Charles M. Lejeune.

DINNERS AND BANQUETS LIVEN DETROIT SHOW TEDIUM

A number of banquets and dinners were held, as usual, during the week of the Detroit motor car show. The King Motor Car Co. gave its annual dinner to the manufacturers of parts and accessories entering into the construction of the King car, and this was attended by 135 guests, including the King officials. Artemas Ward, president of the company, was unable to attend but sent an address, which was read by Artemas Ward, Jr., and to each parts manufacturer was given a copy of an encyclopaedia of food, one of the finest products of another of Ward's interests and having a retail value of \$10.

About 50 members of the selling forces of the Champion Spark Plug Co., Toledo, O., and the Jeffery Dewitt Co., Detroit, held their convention, visited the plants of the King and Ford companies, lunched at the Wolverine Automobile Club, supped at Shore Acres, and banqueted at the Frontenac Cafe.

At the Tuller a banquet was given by the Olds Motor Works, Lansing, Mich., to some 50 Olds veterans, the feast being presided over by former President L. Smith.

Paige-Detroit dealers from the Middle West, 150 strong, banqueted at the Edelweiss and were afterwards treated to a two-part moving picture show; the first part showed the Los Angeles-Phoenix race, in which Paige-Detroit cars finished second and third, while the second part covered a trip through the factory.

The annual convention of the dealers of the Federal Motor Truck Co. was held January 20 to 22, and more than 150 attended, coming from all over the country. A banquet was served at the Ponchartrain.

All the members of the sales force of the Bemb-Robinson Co., Hudson distributors for Detroit, were the guests of W. J. Bemb and L. J. Robinson. The gathering was attended by 14 guests.

Army Truck Bill Is Passed

The army appropriation bill, carrying \$10,000,000, was passed by the House funds for the maintenance of all branches of the army during the coming fiscal year, includes \$50,000 for armored motor cars.

10,000 PERSONS A DAY VISIT CLEVELAND SHOW

**Record Attendance and Sales Mark 14th
Annual Exhibition—More Than
1,000 Cars Reported Sold—**

Will Repeat Show

In the most successful automobile show ever presented in Cleveland, dealers and factory representatives disposed of cars totalling a value of nearly \$1,000,000, according to the best estimates of show officials.

Ohio, Pennsylvania and Indiana dealers, ordering through the Cleveland factory branches who introduced the 1915 models at the local show, placed the majority of orders. Approximately 20 per cent of the sales were made to Cleveland purchasers.

An average of 10,000 people visited the show each day of the week, with nearly half of the attendance represented in visitors and dealers from down state.

Ninety-six exhibitors occupied space in Wigmore coliseum, where the show was held. Forty-six displayed pleasure cars, 11 trucks and 39 accessories. The pleasure car exhibitors presented an average of five models.

Estimated sales made during the show number slightly more than 1,000, with most of them on cars retailing around \$1,000. The Ohio-Buick company placed the orders of single purchasers and down state dealers for about 390 cars; Oakland Motor Co., dealers for Cleveland, 70 cars; Packard Cleveland Co., 18 cars; Trenton Motor Sales Co., 38 cars.

Additional orders were placed by the Velie Motor Car Co., Lucas & Christenson, Mitchell and Paige dealer; Stark Auto Co., Allen and Apperson dealer; the White Co., the Banting Machine Co., Paterson dealer; Jackson Motor Sales Co., Joseph H. Greenwald, Chalmers dealer; Peerless Motor Car Co., Neighbors Motor Car Co., Dodge dealer; Overland-Cleveland Co., Anderson Electric Car Co., Hudson Stuyvesant Co., Hudson dealer; Winton Motor Car Co., Milburn-Cleveland Co., Milburn electric dealer; Hamilton Motor Car Co., Chevrolet dealer; the Auto Sales Co., Reo dealer; A. R. Davis Motor Co., Studebaker dealer; Rauch & Lang Carriage Co., Dunham Motor Car Co., King and Moon dealer; the F. B. Stearns Co., Ford Motor Co., Cleveland Motor Car Sales Co., Hupmobile and Haynes; Richardson Motor Car Co., Cole dealer; Cuyahoga Sales Co., Chandler dealer;

Clay Engine Co., Auburn dealer; Weaver-Brownlee Co., Pierce-Arrow dealer; Baker Motor Vehicle Co.

Truck sales were made and business men interested in the offers of the International Harvester Co., Gabriel Auto Co., Gabriel dealer; Standard Motor Truck Sales Co., Denby dealer; Chicago Pneumatic Tool Co., Little Giant dealer. Trucks were exhibited by a number of dealers representing manufacturers who produce trucks as well as pleasure vehicles.

This was the fourteenth annual show of the Cleveland Automobile Co. The enthusiasm of exhibitors over its success as a drawing feature and for the sales it stimulated promises support for an exposition next year.

Changes Among Prominent Tradesmen

H. D. MacIntyre, for some time with the Stutz agency in Boston, Mass., resigned a few days ago to join the sales force of the Paige-Detroit agency.

W. S. Jameson has been appointed manager of the Rauch & Lang electric branch in Boston, succeeding Mr. Boulden, who has joined the Chase Motor Truck Co.

Joseph Rogers, of Quincy, Mass., formerly with the Chalmers Motor Car Co., has leased the Edison Park garage, Quincy, where he is now proprietor of the business.

Frederick H. Adams, one of the pioneers in the motor truck selling business, has joined the sales force of the Reed-Crockett Co., Boston, that has just taken on the Briggs-Detroit.

Arthur C. Warren has joined the sales force of the Whiting Motor Co., Metropolitan distributors for the Mercer car. Until recently he was secretary and manager of the Dimond-Warren Co., New York.

James Ryan, who had 12 years experience in the automobile and carburetor business as engineer and demonstrator, and who during the last three years was representative in Indianapolis, Ind., for the Rayfield carburetor, recently resigned to become associated with the Detroit Lubricator Co., manufacturers of the Stewart carburetor.

W. A. Clare, formerly in the research department of the Burroughs Adding Machine Co. and later with the Service Recorder Co., in charge of motor transportation problems, has joined the ranks of the Chase Motor Truck Co., Syracuse, N. Y., and will have charge of the Dealers and Research department, which was established by H. T. Boulden, who recently became general sales manager of the Chase company.

ABOLISH OFFICE OF FIRE MARSHAL

**Leader Hinman's Measure Passed
in Assembly by Vote of 93 to 38**

**—Assured of Passage in
Senate Next Week**

FAVORED BY GOV. WHITMAN

**Governor Has Called Office Useless and
Urged Its Abolition**

The office of New York state fire marshal has been abolished; and the lengthy and somewhat picturesque set of garage regulations which the present incumbent, Thomas J. Ahearn, promulgated—and let it be known would be enforced—has been ordered buried in the archives of the state library.

The measure which brought about the abolishment of the office was introduced by Majority Leader Hinman and was passed through the Assembly last night by a vote of 93 to 38, the Republicans voting solid and carrying the Progressives with them. The measure will go to the Senate next week where it is practically certain of the same reception it received in the Assembly. And as Governor Whitman originally strongly urged the abolition of the department as worthless, there can no longer be any doubt of the ultimate outcome.

In the exceedingly brief debate which preceded the passage of Hinman's measure, Democratic Leader A. E. Smith was the only man who had a good word to say for the office of state fire marshal. In his plea he stated that more than 7,000 inspections had been made under the state fire marshal which never had been made before and that the department was saving life and limb and money.

Assemblyman Hinman's chief contention, which is backed up by Governor Whitman, was that the state fire marshal's office represents excess baggage, carried by the people without return.

The abolition of the office brings to a successful end the fight which has been waged by the Automobile Trade Association of New York State, headed by R. H. Johnston, of the White company, and Attorney Charles Thaddeus Terry and Secretary Charles A. Stewart. At the request of this association the rules which applied to all cities in New York state with a population of 1,000,000 and over were suspended indefinitely, pend-

ing an investigation and a proposal to redraft and make them feasible and fair. Assemblyman Hinman's measure, which is exceptionally short, follows:

AN ACT

To repeal article 10-a of the insurance law, relating to the state fire marshal, and acts affecting the application of such article, to terminate the powers, duties and office of the state fire marshal and provide for the care of the records of his office.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Article 10-a of chapter 33 of the laws of 1909, entitled "An act in relation to insurance corporations, constituting chapter 28 of the consolidated laws," as added by chapter 451 of the laws of 1911 and amended by chapter 453 of the laws of 1912 and chapters 192, 204, 214, 303, 393, 405, 431, 432, 433, 434, 520 and 523 of the laws of 1913, and comprising sections 350 to 375, inclusive, and sections 377 to 379, inclusive, is hereby repealed and the office of state fire marshal and all offices and positions therein abolished. All property, books, papers, records and documents pertaining to the office, powers and duties of state fire marshal in the possession or control of such officer or his subordinates, shall be delivered on demand to the director of the state library and by him kept and preserved until otherwise provided by statute.

2. Section 2 of chapter 453 of the laws of 1912, entitled "An act to amend the insurance law, in relation to state fire marshal," is hereby repealed.

3. This act shall take effect immediately.

Gas Goes Down in Milwaukee

Gasoline prices in Milwaukee, which have been unchanged for more than three months, took a decided drop last week. The decline ranges from 1 cent for 60 to 62-degree fuel to 3½ cents for the 72-degree. Quotations for tank wagon delivery, which also hold good for individual buyers who fill their cars at the warehouses or downtown filling stations operated by Standard and independents, are as follows: 60-degree, 11 cents; 65-degree, 13 cents; 70-degree, 15 cents; 72-degree, 16 cents. The last change in prices was recorded August 10, when gasoline soared from ½ to 1½ cents, the 60-degree fuel, then 11 cents, going to 11½ cents. Today's quotations are practically the same as on August 1, 1914.

BOSTON SUPPLY DEALERS' FIRST ANNUAL BANQUET

**Prominent Accessory Men From All
Over Massachusetts Break Bread
Together—Urge Price Maintenance and Fair Dealing**

The first banquet of the Boston Automobile Accessory Dealers' Association, which was held at the American House, Monday evening, brought together the most prominent men in the industry from all over eastern Massachusetts. There were more than 300 present, and among the number were several of the well known dealers in motor cars in Boston. Ernest A. Gilmore, ex-president of the Bay State A. A., was toastmaster. President George H. Brophy, in introducing Mr. Gilmore, called attention to the fact that men in the accessory lines in other parts of Massachusetts were following the Boston dealers' plan, and that soon it would be possible to have the organizations amalgamated so that there would eventually be not only a Boston association, but a Massachusetts one, and finally a New England organization.

Gilmore introduced as the first speaker, E. H. Gaunt, of Babson's Statistical Organization. Gaunt took as his topic "Cooperative Competition," and by means of figures he showed how it was possible to have members of an organization get the best results without injury to each other.

Frank W. Whitcher, of New York, a member of the maintenance of retail prices committee of the United States Chamber of Commerce, was the next speaker. He discussed the Stevens bill in all its details and gave some interesting information relative to the recent decisions of the United States courts where they said that a manufacturer could not insist upon the dealer selling at the maker's retail price. He gave the members much advice on what they could do under the present laws, and urged a broad selling policy.

L. C. Rockhill, of the sales department of the Goodyear Tire & Rubber Co., came on from Akron, O., to address the meeting. His topic was "Price Cutting and Organization in the West." Rockhill pointed out the beneficial results of organizations such as the Boston one, and compared it to some of those in the West with which he was familiar. His talk brought out clearly the advantages to the dealer who plays fair because the big companies now in the accessory field making articles will give such dealers every opportunity to get along.

Secretary Chester I. Campbell, John L. Hamilton, representing the Bay State A. A., and John N. Cole, of the Boston Efficiency Commission, representing Mayor James M. Curley, also spoke.

The banquet ended with cheers for all the speakers and the officers of the association, following the adoption of resolutions favoring the Stevens bill, copies of the resolve being ordered sent to all the Massachusetts Senators and Representatives, and also to President Wilson.

BUSINESS ASSOCIATION FOR BENEFIT OF TRADE

**Wisconsin Garagemen and Dealers in
Cars and Accessories Perfect Organ-
ization—Will Seek to Remedy
Trade Evils**

The Wisconsin Automobile Business Association, incorporated last week without capital stock by representatives of nearly every supply and accessory house in Milwaukee, has perfected its organization by the election of the following officers:

President, W. J. Schubert, Milwaukee Auto Specialty Co.; vice-president, F. Olson, Curtis Automobile Co.; secretary, Rolana Mueller, A. O. Smith Co.; treasurer, Oscar F. Fischodick, Auto Supply Co.; directors, H. P. Andrae, Julius Andrae & Sons Co.; H. A. Torrey, Theodore J. Marlier, Henry O. Stenzel, Milwaukee Tire & Supply Co.; M. H. Brand, H. E. Wilson, William Bruhy, O. H. Lemke, and the officers.

The association starts with an active membership of 150, representing motor car dealers, garages, repair-shops, supply and accessory stores, manufacturers or parts and supplies. The principal object is to promote the interests of the motor car and supply business in general; induce uniform practices in conducting business; prevent price cutting and undue discounting, and supervise credits.

FIRST BANQUET OF THE BOSTON AUTOMOBILE ACCESSORY DEALERS ASSOCIATION, JAN. 25th



Those standing at the speaker's table, left to right, are as follows: P. H. Everett; Secretary Chester I. Campbell, Boston Automobile Dealers Association; L. C. Rockhill, Goodyear Tire & Rubber Co.; F. C. Whitcher, U. S. Chamber of Commerce; President G. W. Brophy, Boston Automobile Dealers Association; E. H. Gaunt, Babson's Statistical Co.; E. H. Gilmore; James Finneran, American Fair Trade League; President E. L. Caton, Worcester Automobile Dealers Association

Hit at 50-Foot Garage Rule

New York Dealers and Garagemen Point Out That If Measure Were Enforced It Would Put Many Garages Out of Business—Garages Safer Than Ever Before—Gasoline Is Less Volatile

The 50-foot rule, which forbids a garage being within that distance of a school, hospital or similar public building in New York city, was fought last Wednesday, January 20, by the Automobile Dealers' Association before the Board of Hazardous Trades. President R. H. Johnston and others of the association addressed the members of the board and requested that the rule be repealed or made less drastic.

It was contended that a garage is less

We ask for the repeal or the very material modification of Section 370 of the Regulations of the Municipal Explosives Commission, reading as follows:

"No garage permit allowing the storage of any volatile inflammable oil shall be issued for any building, shed, or enclosure which is situated within 50 feet of the nearest wall of a building occupied as a school, theater, or other place of public amusement or assembly."

This regulation embodies a most unusual and extraordinary principle, namely,—that the use to which an owner may put his property is limited by the character of adjoining property. This extraordinary discrimination against the garage, as such, can be justified only on the ground that the garage is an extraordinary hazard and is more dangerous to adjacent property than any other class of structure whatsoever. It is the purpose of this brief to show that the garage does not constitute a greater hazard than other classes of property which are not discriminated against and that, on the contrary, the garage is much less hazardous than many other classes of structures.

Garages of Yesterday and Today.—We believe that any prejudice which may exist to the effect that the garage is a particularly hazardous structure must date back to the garages as conducted in the early days of the industry. It was about fifteen years ago that automobiles began to appear in any number upon the streets of this city. The automobiles of that day were in the experimental stage, and, as we look back upon them today, had many grievous defects in construction. The garage of that day was quite as crude as the automobile. Automobiles were housed in any convenient structure, the most popular being buildings which had formerly been used as stables or bicycle repair-shops. In these garages one or more barrels of gasoline were kept in a corner and the method of filling the gasoline tanks was for the garage employee to open a spigot in the barrel, fill an open can and then pour from the can into the tank of the automobile.

At that time there might have been some justification for such a regulation as we now ask you to repeal, but the conditions which existed in those early years no longer exist. The modern automobile is practically fool-proof in its operations and it is certainly leak-proof. The barrel of gasoline has been banished from the garage. In its place every garage in New York city has installed a system of underground storage which is as safe as the ingenuity of man can devise. There has never been an explosion of an underground gasoline tank. In fact, such an explosion is impossible for reasons which will be later set forth. In the few garage fires which have occurred in this city there has not been a single case where the gasoline in the underground tanks was consumed.

In filling automobiles gasoline is drawn by pumps from the underground tanks into portable tanks or, in a very few instances, into safety cans. From the portable tank it is pumped directly into the tank of the automobile, or from the safety can it is poured into the tank of the automobile. In neither case is the gasoline exposed to the open air nor is there any chance for any to drip upon the floor if the most elementary precautions are observed. The result is that, in a well conducted,

hazardous than many other supposedly "safe" buildings and that were the rule to be rigidly enforced it would unjustly force many garagemen out of business. Inasmuch as regulations which are adopted in many other cities are copied from those of New York the brief of President Johnston against the rule may be used by any association which has to contend with a measure of similar character. The full text of the brief is as follows:

up-to-date garage, there is not even an odor of gasoline.

Gasoline of Today Is Not Very Volatile.—In the earlier years of the automobile industry there was but a limited demand for gasoline, and its price was lower than that of kerosene. The result was that the refiners sold as gasoline only the very lightest and most volatile products from the distillation of petroleum. The gasoline of those days, when exposed, rapidly volatilized and mixed with the air of the garage.

Today conditions are reversed. Gasoline is very much more expensive than kerosene and the demand for gasoline taxes the resources of the refiners. The result is that the product sold under the name of gasoline is very much heavier than the gasoline of a few years ago. The refiners have entirely changed their methods of distillation and the present gasoline may be described as non-volatile when compared with the gasoline which was on the market as recently as five years ago. No further argument is necessary to show that the gasoline of today is a much less dangerous commodity than the gasoline which was common when the above regulation was first conceived.

Explosive Only Under Certain Conditions.—It is a common fallacy, particularly in official circles, to regard a mixture of gasoline vapor and air as necessarily explosive. That this idea is erroneous is known to every one who has ever studied the scientific side of the subject. D. Clerk, the great English authority, who has devoted years of research to the explosibility of gases, gives the following figures in his great treatise entitled, "Gas, Petrol and Oil Engines":

"At atmospheric pressure gasoline vapor will form an explosive mixture with air only when the percentage of gasoline vapor present in the mixture is between 1.32 per cent and 4.7 per cent."

In other words, there is a range of only 3.3 per cent between the weakest and the strongest mixtures which can be exploded at atmospheric pressure.

My contention is that, in the garage of today, with the gasoline of today, it is practically impossible to obtain a mixture of the richness of 1.32 per cent of gasoline—that is, a mixture which will explode. The only way to do so would be to shut off all ventilation from the garage and to leave shallow pans of gasoline around the garage so that the necessary percentage might evaporate into the air. No one, unless bent on incendiarism would think of adopting this procedure, and incendiarism cannot be reached by regulations.

Comparing Combustibility of Gasoline.—We think that the figures quoted in the preceding section from Mr. Clerk's book, should dispose of the fear that there is any chance of an explosion of gasoline vapor taking place in a garage. There still remains to be considered the undisputed fact that gasoline is a combustible substance and that, when exposed to flame, it will burn. That is certainly true—but it is also true of wood, paper, woolen goods, cotton goods, and all the other materials which are present in such great quantities in practically every structure in this city.

Let us compare, for example, the "amount of

POINTS MADE BY DEALERS. AT HEARING AGAINST 50-FOOT RULE

- 1—Modern garages are fireproof.
- 2—Gasoline storage systems are fireproof.
- 3—Modern gasoline is less volatile than in the earlier days of the industry.
- 4—Gasoline is less explosive than commonly believed.
- 5—Many supposedly "safe" materials are just as combustible as gasoline.
- 6—Wood takes fire at a lower temperature than gasoline.
- 7—Garages contain less combustible material than many buildings classed as "safe."
- 8—There are employees in a garage 24 hours a day, lessening the fire hazard.
- 9—A garage should be a preferred, not a condemned, neighbor.
- 10—The regulation does not lessen the possibility of panic.
- 11—The regulation acts as a deterrent to garage erecting; business men will not build if a "movie" man can open up next door and force them out of business.

fire" or heat which results from the combustion of gasoline and wood. A pound of gasoline, during combustion, yields about 15,000 British Thermal Units (hereafter referred to as B. T. U.). The authority for this statement may be found in Richard's article in the Journal of the American Chemical Society for March, 1910. One pound of oak yields, during combustion, 8,316 B. T. U., and one pound of pine yields 9,153 B. T. U. These figures for wood may be found on page 59 of Snow's "Steam Boiler Practice."

To sum up the above figures, a pound of gasoline does not make any more of a fire than about two pounds of pine or about two and a quarter pounds of oak. A gallon of gasoline weighs approximately 6 pounds, and it is therefore evident that a gallon of gasoline, when burning, gives out the same amount of heat as 11 8/10 pounds of pine or 13 pounds of oak.

To make the matter clear, I have here a piece of oak 18 x 2 1/2 x 1 1/2 inches and a piece of yellow pine 18 x 2 1/4 x 1 1/4 inches. Each of these pieces of wood will make exactly as much fire and therefore offers exactly the same fire risk as a gallon of gasoline. If we are to discriminate against a structure because it contains gasoline, we must make exactly the same discrimination against a structure which contains pine or oak or any other combustible material. A 5-foot, roll-top desk weighs about 450 pounds and will make just as much fire as 34 gallons of gasoline, which is about the equivalent of the contents of the tanks of two automobiles. Therefore, we cannot make any discrimination against a building or room which contains two automobiles if we are not prepared to make that same discrimination against any room which contains a 5-foot roll-top oak desk.

Wood Fires at Lower Temperature.—There is another significant quality in gasoline which renders it very much less dangerous, as compared with other materials, than is generally supposed. Wood will take fire at a temperature of from 644 to 680 degrees F., and gasoline will not take fire until the temperature is raised to 1,200 or 1,250 degrees F. These figures may be found on page 67 of Ingle's "Chemistry of Fire and Fire Prevention." These figures cannot be challenged and their significance is that wood is a more dangerous article in the vicinity of a fire than is gasoline.

THE DENSITY OF COMBUSTIBLE MATERIAL WITHIN A GARAGE IS LESS THAN THE DENSITY OF COMBUSTIBLE MATERIAL IN ANY OTHER CLASS OF STRUCTURE.

From the very nature of the construction of the automobile, the amount of combustible material per square foot or per cubic foot in a garage is less than that in almost any other class of industrial structure, and is certainly less than in the ordinary residence or apartment. Every automobile is at least 5 feet wide and there are very few which are less than 12 feet long. Probably the average length of the automobiles in this city would be nearer 14 feet than 12 feet. It is thus evident that each automobile covers an area of from 50 to 70 square feet, and, owing to their peculiar nature, automobiles cannot be piled one upon another, as is done with almost all other commodities.

In the very room in which we are holding this hearing, there is more combustible material such as wooden chairs, desks, tables, papers, etc., than in any garage of the same area in New York city. What logic is there, therefore, in officially designating the garage as a place of a fire hazard so abnormal that it may not even be put next door to certain specific classes of buildings?

I can start a factory for the manufacture of matches! I can open a moving picture theater and store therein anything under 10,000 feet of film; I can run a lumber-yard, a wood-working shop, or any one of a hundred different lines of business, next to a school or church without hindrance, even though every one knows that these industries offer a much greater hazard than does the garage. But the minute I contemplate running a garage, the law says, "You cannot do it next to a theater or a school."

THE METHOD OF OPERATION OF THE GARAGE REDUCES THE FIRE HAZARD TO A MINIMUM.

The garage is an exceptionally safe building for the reason that almost alone among industrial establishments, there are people at work within it at almost all hours of the day and night. This means that if a fire starts within a garage the alarm can be given instantly. In almost every other class of industrial establishment there are no workers at all within the establishment except for possibly ten hours out of the twenty-four. There may be a watchman within the building, but this is by no means the rule except in the largest establishments.

Another element resulting in the safety of the garage is that it is much better provided with fire-fighting facilities than any other class of structures. Furthermore, the employees are almost all adult males (except possibly for the office help) and therefore, a panic is not apt to occur if a fire should break out. As one observer has said, "If fire breaks out in any other kind of factory, the employees run away from it. If fire breaks out in a garage, the employees run to it." That is, they seize the hand extinguishers and are apt to extinguish the fire right then and there.

GARAGES ARE MORE NEARLY FIRE-PROOF THAN ANY OTHER CLASS OF STRUCTURES.

Anyone who has observed the construction of the various classes of buildings in this city, must

agree with the statement that, as a class, garages are more nearly fireproof than any other class of structure. One reason is that automobile concerns as a class are housed in newer structures than any other class of business. The buildings intended for automobile purposes, which have been built in the last few years, have been as near fireproof as it is possible to build them. Of course, there are some concerns selling automobiles and some concerns storing automobiles which have not yet fireproof structures, but there is no disputing that the tendency of the industry has been to get into fireproof structures and those who are not yet in them, will, if allowed to prosper, get into them as soon as their obligations and finances will permit. Even the garages which are not fireproof have quite generally been so improved as to be of far better construction than is the case with any other class of buildings.

Garage Should Be Preferred Neighbor.—For the reasons that a garage contains less combustible matter than any other class of structures, that it is operated under closer supervision and with more safeguards than any other class of structure, and that the construction of the garage itself, in the majority of cases, is more nearly fireproof than that of any other class of structure, the garage should be regarded as a preferred neighbor; and it would not be illogical for the city departments to put a premium on the garage which will locate itself next to a school or church and thus serve as a bulwark for it.

Regulation Does Not Reduce Chance of Panic.—It is reasonable to suppose that in specifying that a garage shall not be located next to a place of public assemblage, those who drew the regulation had in mind the possibility that a panic might ensue if the garage should catch fire while there was a large assemblage of people in the adjoining building. We grant that there might be a panic in a church or school if a fire should occur in a garage next door, but will the panic occur simply because of the fact that it is a garage which is on fire? The answer is obvious. There will be just as much panic if the building next door is an apartment house or a private dwelling or a wood-working establishment or any other class of structure. There will be almost as much panic or tendency to panic, if the fire is across the street or one hundred feet away, or if the fire is around the corner and a few pieces of fire apparatus take up their station in front of the place of assemblage. (It takes a fair sized fire to make as much smoke as a New York fire engine.)

If it is the aim of the Department to protect places of public assemblage from fire hazard the only sensible thing to do is to pass a regulation that no structure of any kind shall be erected within 50 feet of such place of public assemblage. To say that every other kind of structure except a garage can be erected next door to a public assemblage is unfair, unreasonable, illogical and, on serious analysis, absolutely absurd.

The property interests affected by this regulation amount to many millions of dollars. There is one garage, for example, which is one of the finest buildings on upper Broadway and which represents with land and building an investment of over a million dollars. This building is next to a church and therefore is outside the pale of

the law. There are several other garages on Broadway of a value exceeding half a million dollars each, which are likewise outlawed. It is probable that, in the city of New York, there are at least one hundred garages, most of them absolutely fireproof, which have been denied a license because of this unjust regulation.

Among the garages operating in violation of this regulation, might be mentioned the Fire Department Garage on East 67th street, where a number of pieces of motor fire apparatus are stored. This building, which was formerly used as fire department headquarters, is next door to a synagogue.

Regulation an Incentive to Blackmail.—A number of those in the automobile business have been contemplating the erection of larger and more modern structures than those which they now occupy. Each of these, however, is reluctant to embark in an investment of from a quarter of a million to one million dollars when there is no guarantee that he will be allowed to enjoy the peaceable possession of his new building. Suppose that a dealer buys a plot of ground and erects a fine, modern, fireproof salesroom and a garage upon it.

Suppose that, after he is comfortably installed in his new building, someone buys the adjoining plot of ground and proceeds to erect thereon, a place of public assemblage. Under the code, this person must be allowed to erect his building provides he complies with the regulations of the Building Department. There is no regulation preventing anyone from erecting a place of public assemblage next to a garage.

WHAT IS THE RESULT? THE MAN WHO ERECTED THE GARAGE AND WHO WAS FIRST ON THE GROUND HAS TO CLOSE UP SHOP! HIS BUILDING, HAVING BEEN ERECTED ONLY FOR GARAGE PURPOSES, BECOMES VACANT AND USELESS—A MONUMENT TO AN UNFAIR AND ABSURD MUNICIPAL REGULATION!

This is the fear which is haunting the mind of everyone in our industry who contemplates moving into an improved structure and no further movement of those in our industry into better quarters can be expected until this regulation is repealed.

On the other hand, the regulation as it stands is an invitation to blackmailers who practice their calling. Take for example, a certain vast automobile establishment which represents an investment of not less than \$1,750,000. Next to this building are some old brownstone houses of no very great value. What is to prevent some unscrupulous person from renting this property, filing plans with the department for the construction of a theater thereon, and then forcing the automobile company to buy him out rather than to see their entire investment sacrificed?

CONCLUSION

It is my earnest hope, as it is my expectation, that this board will forthwith repeal the regulation complained of. The fact that the board has granted us this hearing shows that it is willing to consider the merits of the regulation, and I trust that the facts presented above have been sufficient to convince them that the regulation should not be allowed to remain on the statute books for another day.

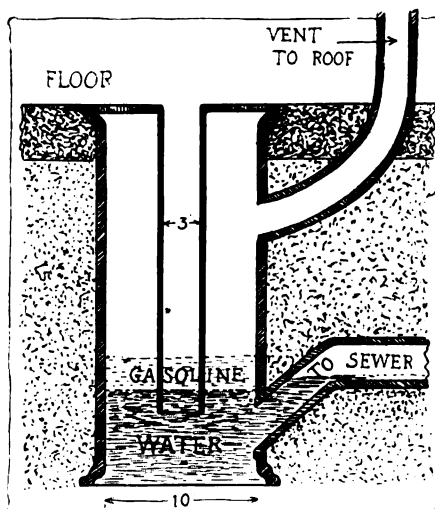
Here's a \$10 Separator That's Simplicity Itself

The Ohio Building Code Commission has evolved a \$10 separator.

And what is equally important, it has disposed of the problem which hinges upon the disposal of such things as may be "separated." All of which is made plain by the accompanying drawing.

The separator is simplicity itself. It consists of nothing more complicated than a length of 10-inch sewer pipe with a length of 3-inch pipe within the larger one. The theory of the device is this:

Water, and gasoline (if there is any) drain down the inner pipe, and as gasoline and oil are lighter than water they float on the water in the reservoir formed at the bottom of the 10-inch pipe; the water flows out to the sewer through the connection indicated in the drawing—and the gasoline simply evaporates and is conducted away through a pipe to the roof of the building. What becomes of



Water and gasoline (if there is any) drain down through the center pipe and collect on top of the water at the bottom. The water runs out to the sewer and the gasoline simply evaporates and is conducted away through the vent

any oil which might find its way down the drain has not been divulged.

It is said the separator can be installed for \$10.

Gulf Oil for Cold Weather

It is to remind us of the old scene that was peopled by Montgomery and Stone in the "Red Mill" where, in a restaurant scene one of the two, the diner, coughed violently, summoned the waiter, and expostulated that a needle was found in his soup. The waiter explained that it was a typographical error and that it should have been a noodle.

In a recent issue of Motor World appeared an advertisement of the Gulf Refining Co., Pittsburgh, in which this line appeared: "The Ideal Sold Weather Oil." It was a typographical error and should have read: "The Ideal Cold Weather Oil."

New Zenith Carbureter for Eights

Has Single Float Chamber and Two Manifold Outlets
—Standard Zenith Features Incorporated

The Zenith Carbureter Co., Detroit, has brought out a special carbureter for eight-cylinder V-type motors, which maintains all of the Zenith features and is similar in construction to the horizontal type brought out by the concern about a year ago. However, there are two outlets to intake manifolds, one for supplying each set of four cylinders, and two throttles. The latter are interconnected, so that the usual throttle lever and accelerator will open or close both simultaneously.

There are two entirely separate and distinct mixing chambers with their jets and throttles, these both being supplied from a float chamber which, with the float mechanism, is common to both. It might be considered that each is a complete carbureter for four cylinders except that only one float chamber is used. There is also only one air intake, this supplying both mixing tubes.

Two-Nozzle Feature Retained

The mixing chambers are horizontal, with the jets entering the venturi section at right angles. Thus, each outlet attaches to the intake connection without bend.

The main feature of the Zenith carbureter is the combination of an ordinary nozzle with another, the flow from which is independent of the suction of the engine. These two nozzles are concentric. The ordinary nozzle, or main jet, M, gets its gasoline from the float chamber through the passage C. It is surrounded by the jet J, which is sup-

plied through the passage N from the well W. This well is open to the atmosphere and gets a measured flow of gasoline through the compensating hole D which is not subjected to the suction and therefore has a steady flow.

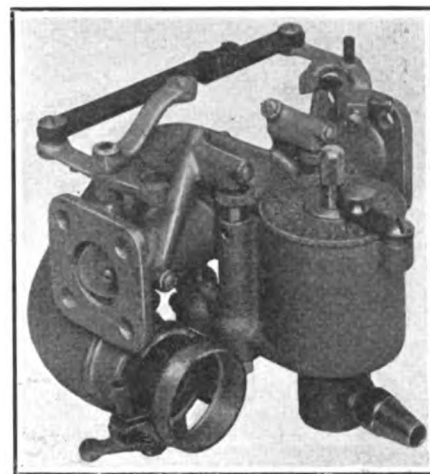
The main jet, if used alone, would give a mixture, the richness of which would be in proportion to the speed, and therefore the suction. At low speeds the suction is low, and therefore the mixture would be lean. At high speeds the suction is greater, and therefore too rich a mixture would result.

Special Adjustment for Slow Speed

To compensate for this the outer jet lends its strong support to the main nozzle at low suction when it is most needed, and withdraws it gradually as the main nozzle gathers in strength with the increasing suction.

The slow-speed arrangement also is a feature of the Zenith construction. It is composed of the idling tube X, the lower end of which is so sloped as to receive the cone upper end of the idling tube Y. This type Y can be screwed up into the end of X more or less by means of the knurled adjusting tube Z. This provides for adjustment of the mixture going through the tube, since air can enter at the base of tube X through holes drilled in an adjusting tube Z.

The tube T connects the idling tube X with the carbureter mixing chamber near the throttle by means of the intervening passage T1. In starting, the suction at the throttle is very powerful and



Exterior view of Zenith eight carbureter, showing double throttle control

fuel is drawn up from the well W through the nozzle of Y and idling tube X, at the bottom of which it mixes with air entering through the holes in the lower part of Z. The mixture is therefore atomized and sprays into the carbureter just back of the throttle and near the end of the mixing chamber. This gives a good starting mixture, and as the throttle is opened wider the compound nozzle comes into action and the effect of the starting "carbureter" gradually is cut down.

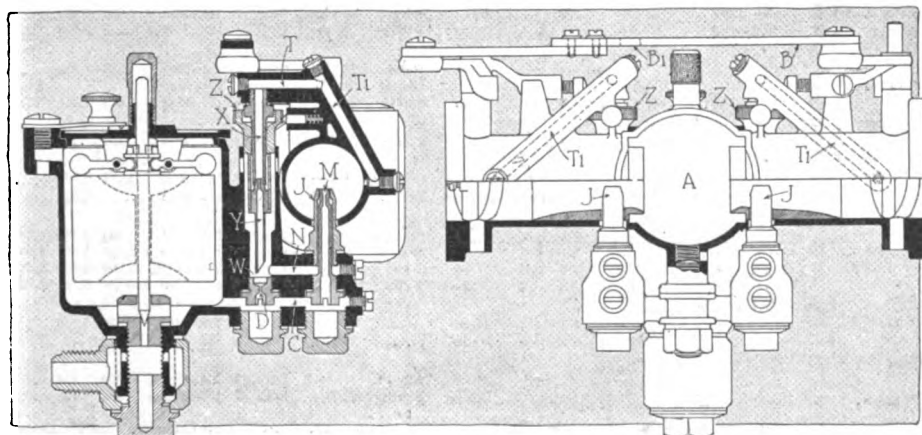
Two Throttles Interconnected

The standard Zenith features of interchangeable nozzles to fit any type of motor, metallic float with overhead float action and removable venturi are retained. The common air intake is shown at A, and each of the mixing chambers opens off it on opposite sides.

The interconnection of the two throttle levers is shown at B, while the hole B1 provides the means of attachment to the control rods. As the figures bring out, there are two complete sets of compound nozzles, two slow speed nozzles, and everything which has to do with the vaporization and mixing of the fuel is in duplicate so that the generation of gas will be in accord with the demands of both sets of cylinders in the V between which the carbureter is intended to be placed.

To Tax Both Horsepower and Weight

Detroit, Mich., Jan. 26.—In the House of Representatives in Lansing, Representative Smith last night introduced a new automobile tax bill which provides a tax of 25 cents per horsepower and in addition a tax of 25 cents per every hundred pounds of weight. The measure, it is said, has the approval of the state highway commissioner and was found to be legal by the attorney general.



The Zenith carbureter for eight-cylinder motors retains the Zenith principle of using a suction actuated nozzle in combination with a nozzle that is independent of suction

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT											
K	4-4½x5½	Spldf	Zenith	A-Lite	Diak	3	116	34x4	1,785	.....	.....
L	4-4½x5½	Spldf	Zenith	A-Lite	Diak	3	121	36x4½	2,085	.....	2,085
F	6-3½x5½	Boach	Zenith	A-Lite	Diak	4	130	35x4½	2,190	2,190	2,290
H	8-3½x4½	Battery	Zenith	Remy	Diak	4	118	34x4	1,685	.....	.....
ALLEN											
34	4-3½x5	Waths	Stmbg	Waths	Cone	3	110	32x3½	885	885	.....
ALTER											
4-27	4-3½x4½	Remy	Holley	Remy	Diak	3	106	30x3½	685	685	.....
APPERSON											
4-40	4-4 x5	.....	.....	.....	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	.....	.....	.....	Band	3	120	36x4	1,685	1,685	.....
6-60	6-4½x5	.....	.....	.....	Band	3	.....	36x4	2,200	2,250	2,350
6-45	6-3½x5½	.....	.....	.....	Band	3	122	34x4	1,485	.....	.....
ARBENZ											
1915	4-4½x5½	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,635	.....
ARGO											
Argo	4-2 5-16x4	A. Kent	Argo	.....	Cone	2	90	28x2½	295	.....	.....
AURURN											
4-36	4-3½x5	.....	Rafld	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	.....	Rafld	.....	Cone	3	126	34x4	1,550	.....	.....
6-47	6-3½x5½	Boach	Rafld	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN											
66	6-4½x6	Waths	Master	Waths	Diak	6	141	34x4½	3,600	3,600	3,600
BAUER											
B	4-4½x5	Mea	Shblr	Emmn	Diak	3	110	34x3½	875	1,000	.....
BRISCOE											
B	4-3½x5½	Spldf	.....	Apico	Cone	3	107	30x3½	785	785	.....
BUICK											
C-24-5	4-3½x5½	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	Delco	Marvel	Delco	Cone	3	130	36x4½	1,650	.....	1,650
CADILLAC											
51	8-3½x5½	Delco	Own	Delco	Diak	3	122	36x4½	1,975	1,975	1,975
CARTERCAR											
9	4-3½x5	Delco	Shblr	Delco	.....	.....	106	33x4	1,250	.....	.....
CASE											
35	4-4½x5½	Roach	Rafld	Waths	Diak	3	120	35x4½	1,600	.....	.....
40	4-4½x5½	Roach	Rafld	Waths	Diak	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	Waths	Stmbg	Waths	Diak	3	115½	34x4	1,250	.....	.....
CHADWICK											
19	6-5 x6	Boach	Own	Waths	Band	4	.....	37x5	5,500	5,500	5,500
CHALMERS											
36-H	6-3½x5½	A. Kent	Rafld	Entz	Diak	3	125½	34x4½	1,650	1,725	.....
M-6	6-4 x5½	Boach	Rafld	Entz	Diak	4	132	36x4½	2,400	2,400	.....
32	6-2½x5	A. Kent	Rafld	G & D	Diak	3	120	34x4	1,400	.....	.....
CHANDLER											
15	6-3½x5	Boach	Rafld	G & D	Diak	3	120	31x4	1,235	.....	.....
CHEVROLET											
H-4	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	.....	875	.....
H-2	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE											
4-40	4-4½x5½	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	.....
6-50	6-½x5½	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,865
6-51	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	Delco	Stmbg	Delco	Cone	3	126	37x5	2,465	2,465	2,465
CRAWFORD											
6-35	6-3½x5	Waths	Stmbg	Waths	Diak	3	120	34x4	1,850	1,850	.....
CROW											
E-42	4-4 x5	G & D	Shblr	Emmn	Diak	3	114	33x4	1,150	1,165	.....
E-32	4-4½x5½	G & D	Shblr	Emmn	Diak	3	120	34x4	1,475	1,600	.....
E-62	6-3½x5½	G & D	Shblr	Emmn	Diak	3	130	36x4	1,885	1,885	.....
C.E.Jr	4-3½x4½	Disco	Holley	Disco	Diak	3	104	30x3½	735	.....	.....
CUNNINGHAM											
8	4-4½x5½	Undec	Stmbg	Undec	Diak	3	120	37x5	.....	.....	2,750
CYCLEPLANE											
Tour	4-2½x4	A. Kent	Own	.....	Diak	3	108	28x3	350	.....	.....
Trav	3-3½x4	A. Kent	Shblr	.....	.....	2	96	28x2½	250	.....	.....
DAVIS											
38-A	4-3½x5	Waths	Stmbg	Waths	Cone	3	112	34x4	1,235	1,235	.....
6-D	6-3½x5½	Boach	Stmbg	G & D	Diak	4	128	37x4½	2,135	.....	.....
DETROITER											
C	4-3½x5	Remy	Stmbg	Remy	Diak	3	112	32x3½	.....	965	.....
DILE											
A	4-2½x4	Bring	Holley	.....	Diak	3	96	28x3	485	.....	.....
DODGE											
...	4-3½x4½	Eismn	Own	N E	Cone	3	110	32x3½	785	.....	.....
DORRIS											
LA-4	4-4½x5	Waths	Stmbg	Waths	Diak	3	121	36x4½	2,200	2,250	.....
DORT											
Four	4-3 x4	Conn	.....	.....	Cone	3	.....	30x3	495	.....	.....
Fire	4-3½x5	Conn	.....	.....	Cone	3	.....	30x3½	.....	680	.....
EMPIRE											
31-40	4-3½x4½	Remy	Holley	Remy	Diak	3	108	32x3½	875	875	.....
ENGER											
6-50	6-3½x5	A. Kent	Rafld	G & D	Diak	3	125	34x4	1,485	.....	1,485
FIAT											
55	4-130x170	Boach	Own	Waths	Diak	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	Boach	Own	Waths	Diak	4	135	37x5	5,150	5,150	5,150
54	4-110x150	Boach	Own	Waths	Diak	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS											
82-E	4-4½x5½	Spldf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	.....
90-E	6-4½x5½	Conn	Rafld	G & D	Diak	3	132	36x4	2,500	2,650	.....
FORD											
T	4-3½x4	Ford	Holley	.....	Diak	2	100	30x3	440	490	.....
FRANKLIN											
6-30	6-3½x4	Eismn	Own	Dyneto	Diak	3	120	34x4½	2,150	2,150	.....
F. R. P.											
45-B	4-4 3-5x5½	Boach	Stwrt	Boach	Cone	4	110	36x4	All bodies to order	.....	.....
GLIDE											
30	4-3½x5	Waths	Shblr	Waths	Diak	3	114	32x4	1,195	1,195	.....
GRANT											
M	4-2½x4	Swiss	Mayer	A-C	Cone	2	90	28x3	425	.....	.....
T	6-2½x4½	A. Kent	Mayer	A-C	Cone	3	106	30x3½	.....	795	.....
GREAT WESTERN											
A	4-4½x5½	Kingstn	Kingstn	G & D	Cone	3	117	36x4	1,710	1,710	.....
B	4-3½x5½	Kingstn	Kingstn	Boach	Cone	3	117	34x4	2,300	.....	.....
HAYNES											
30	6-3½x5	Remy	Rafld	L-N	Diak	3	121	34x4	1,485	1,485	.....
31	6-4½x5½	Simms	Stmbg	L-N	Band	3	130	36x4½	.....	2,250	.....
33	6-3½x5	Remy	Rafld	L-N	Diak	3	127	35x4½	.....	1,850	.....
32	4-4½x5½	Simms	Stmbg	L-N	Band	3	118	34x4	1,060	.....	.....
HERFF-BROOKS											
4-40	4-4½x5	Roach	Stmbg	Apico	Cone	3	118	31x4	1,100	1,100	.....

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
LAMBERT 48-C 68-C	4-3/4x4 4-4x5 1/2	Brggs Brggs	Shblr Shblr	Brggs Brggs	..... .....	113 117	32x3 1/2 34x3 1/2	..... 1,300 1,565 1,565	...............	...............	...............
LENOX Four Six	4-4x5 1/2 6-3/4x5 1/2	Wths Wths	Own Own	Wths Wths	Cone Cone	118 130	34x4 34x4 1/2	..... ..... 2,000 2,465	....................	....................	....................
LEWIS ...	6-3/4x6	Brggs	Stmbg	Remy	Disk	135	36x4	1,600 1,600	..........	..........	..........
LEXINGTON Four 6-L 6-M 6-4x5	4-3/4x5 1/2 6-3/4x5 6-4x5	Wths Wths A. Kent	Shblr Shblr Stmbg	Wths Wths Jesco	Disk Disk Cone	115 123 130	34x4 34x4 36x4 1/2	1,375 1,875 2,575 2,575	1,375 1,875 2,575 2,575	....................	....................
LOCOMOBILE M-5 B-5	6-4x5 1/2 6-4x5	Bosch Bosch	Own Own	Wths Wths	Disk Disk	140 133	37x5 37x5r	5,100 4,400	5,100 4,400	..........	..........
LUVERNE 700	6-4 x5	Bosch	Shblr	Jesco	Disk	128	36x4 1/2	..... .....	..... .....	2,500	.....
LYONS-KNIGHT K-4	4-4x5 1/2	Simms	Stmbg	N E	Disk	130	37x5	..... .....	2,900 2,900	..........	..........
MARMON 41 48	6-4x5 1/2 6-4x6	Bosch Bosch	Stmbg Zenith	Bosch Both	Cone Disk	132 1/2 145	36x4 1/2 37x5r	3,250 5,000	3,250 5,000	3,250 5,000	...............
MAXWELL 25	4-3/4x4 1/2	Simms	Kngrtn	Simms	Cone	103	30x3 1/2	725 750	725 750	..........	..........
McFARLAN T X	6-4 x5 6-4 1/2x5	Wths Wths	Stmbg Stmbg	Wths Wths	Cone Cone	132 133	36x4 1/2 36x4 1/2	2,500 2,500 2,500	2,500 2,500 2,500	...............	...............
McINTYRE 25 6-40	4-3/4x5 1/2 6-3/4x4 1/2	Bosch Brggs	Stmbg Stmbg	G & D Brggs	Cone Disk	106 130	32x3 1/2 35x4	..... ..... 850 1,275	..... ..... 850 1,275	....................	....................
MERCER Spdstr Bdstr	4-3/4x5 1/2 4-3/4x5 1/2	Bosch Bosch	Zenith Zenith	U.S.L. U.S.L.	Disk Disk	130 130	34x4 1/2 34x4 1/2	2,750 3,000	..... ..... 3,000	...............	...............
METEOR 43 46	4-4 x5 6-3x5	A. Kent A. Kent	Stmbg Stmbg	Spidf Spidf	Disk Disk	114 136	34x4 35x4	..... ..... 1,975 1,365	..... ..... 1,975 1,365	....................	....................
METZ 22 25	4-3/4x4 4-3/4x4	Bosch	Own A.W.T.	G & D G & D	..... .....	96 105	30x3 32x3 1/2	405 600	..... ..... 600	...............	...............
MITCHELL Four Six 7-6 5-6	4-4 x5 1/2 4-4 x5 1/2 6-4x7 6-4x6	Conn Conn Remy Remy	..... ..... ..... .....	Spidf Spidf Bemy Bemy	Cone Cone Cone Cone	116 123 144 133	34x4 36x4 37x5 36x4 1/2	1,250 1,585 1,895	1,250 1,585 1,895	..... ..... 2,330.....	....................
MOLINE-KNIGHT ...	4-4 x5	Bosch	Shblr	Wgner	Cone	128	36x4 1/2	2,500 2,500 2,500	2,500 2,500 2,500	...............	...............
MONARCH Six	6-3/4x5	A. Kent	Zenith	W. Lord	Cone	125	33x4	..... 1,250 1,275	..... 1,250 1,275	...............	...............
MONROE M-2	4-3 x5 1/2	Conn	Zenith	A-Lite	Cone	96	30x3	400..........	...............	...............	...............
MOON 4-38 6-40 6-50	4-3/4x5 6-3/4x5 6-3/4x5 1/2	Delco Delco Delco	Rafid Rafid Rafid	Delco Delco Delco	Disk Disk Disk	122 123 130	34x4 34x4 35x4 1/2	1,350 1,575 2,150	1,350 1,575 2,150	...............	...............
MORSE D	4-4x5	Elsmn	Stmbg	G & D	Disk	127	36x4 1/2	3,000 3,000 3,000	3,000 3,000 3,000	...............	...............
NATIONAL AB	6-3/4x5 1/2	Elsmn	Rafid	Wths	Cone	134	36x4 1/2	2,375 2,375	2,375 2,375	..........	..........
NORWALK F	6-3/4x5 1/2	A. Kent	Rafid	G & D	Disk	131	37x4	1,875..........	...............	...............	...............
OAKLAND 37 40 Spdstr	4-3/4x5 6-3/4x5 6-3/4x5	Delco Delco Delco	Marvel Johan Marvel	Delco Delco Delco	Cone Cone Cone	112 123 1/2 113	33x4 35x4 1/2 37x4	1,150 1,100	1,300 1,085	...............	...............
OLDSMOBILE 43 55	4-3/4x5 6-4x5 1/2	Delco Delco	Marvel Marvel	Delco Delco	Cone Cone	112 129	33x4 36x5	1,285 2,975	1,285 2,975	...............	...............
OVERLAND 80 81 82	4-4x5 1/2 4-4 x4 1/2 6-3/4x5 1/2	Bosch Spidf Bosch	Shblr Shblr Shblr	A-Lite A-Lite A-Lite	Cone Cone Cone	114 106 125	34x4 32x4 35x4 1/2	1,050 795 1,475	1,075 850 1,475	....................	....................
OWEN ...	6-3/4x5 1/2	Own	Master	O.M.	O.M.	126	35x5	2,750 2,750	..... ..... 2,750	...............	...............
PACKARD 3-38 5-48	6-4 x5 1/2 6-4x5 1/2	Bosch Bosch	Own Own	Bljr Bljr	Plate Plate	140 144	37x5r 37x5	3,750 4,750 4,750	3,750 4,750 4,750	3,850 4,850	..........
PAIGE Six 35	6-3/4x5 1/2 4-4 x5	Bosch Bosch	Rafid Stwrt	G & D G & D	Disk Disk	124 116	34x4 34x4	1,285 1,975	1,285 1,975	1,285 1,975	..........
PARTIN-PALMER 20 35	4-3/4x4 6-3/4x5 1/2	A. Kent A. Kent	Muir Stmbg	G & D G & D	Disk Cone	96 115	28x3 33x4	685..........	...............	...............	...............
PATERSON 4-33 6-48	4-3/4x5 6-3/4x5	Delco Delco	Stmbg Stmbg	Delco Delco	Cone Cone	112 124	32x4 34x4	..... ..... 1,085 1,085	..... ..... 1,085 1,085	....................	....................
PATHFINDER ...	6-3/4x5 1/2	Wths	Shblr	Wths	Disk	126	34x5 1/2	2,322 2,322	..... ..... 2,322	..... ..... 2,322	...............
PEERLESS 54 55 60-6	4-3/4x5 6-3/4x5 6-4x6	A. Kent A. Kent Bosch	Stmbg Stmbg Own	G & D G & D G & D	Disk Disk Band	113 121 137	34x4 34x4 37x5	2,900 2,250 4,900	2,900 2,250 4,900	2,000 2,250 5,000	...............

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PETER PAN 3-E	4-2x4 1/4	Bring	.....	.....	Disk	110	29x3 1/2	650..........	...............	...............	...............
PIERCE-ARROW C-3 B-3 A-3	6-4 x5 1/2 6-4x5 1/2 6-5 x7	Bosch Bosch Bosch	Own Own Own	Wths Wths Wths	Cone Cone Cone	124 142 147 1/2	36x4 1/2 37x5 38x5 1/2	4,300 4,900 5,900	4,300 4,900 5,900	..... ..... 6,000	..... ..... 6,000
PILOT 55 75	6-3/4x5 1/2 6-4x6	Wths Wths	Shblr Crr	Wths Wths	Cone Cone	126 123	34x4 37x4 1/2	1,885 2,585	1,885 2,585	1,885 2,585	1,885 2,585
PREMIER 6-50	6-4 x5 1/2	Elsmn	Rafid	Remy	Disk	132	36x4 1/2	1,985 1,985 1,985	1,985 1,985 1,985	...............	...............
PRATT 6-50	6-3/4x5 1/2	A. Kent	Rafid	G & D	Disk	123	37x4 1/2	2,150 2,150 2,350	2,150 2,150 2,350	...............	...............
PULLMAN Jr 6-48	4-3/4x4 1/2 6-3/4x5 1/2	Spidf Simms	Stmbg Stmbg	Spidf Wths	Disk Disk	110 124	36x3 1/2 38x4 1/2	740 2,500	740 2,500	..... 2,500	..... 2,500
RAYFIELD 20	4-2x4 1/2	.....	Own	.....	Disk	96	28x3	..... .....	..... .....	305.....	..........
R-C-H K	4-3/4x5	Bosch	B-D	W. Lord	Cone	110	32x3 1/2	..... .....	..... 775	..........	..........
REGAL D	4-3/4x5 8-27x4 1/2 4-3/4x3 1/2	A. Kent	Stwrt	Bosch	Cone	112 105	32x4 32x4 30x3 1/2	1,085 1,250 650	1,085 1,250 650	...............	...............
REMINGTON ...	4-3/4x4	A. Kent	.....	W. Lord	Cone	106	30x3 1/2	695 695	695 695	..........	..........
REPUBLIC E	6-4x5	Delco	Rafid	Delco	Cone	123	36x4 1/2	..... 2,950 2,950	..... 2,950 2,950	...............	...............
REO M ST B	6-3 9-16x5 1/2 4-4x4 1/2 4-4x4 1/2	Remy Natl Remy	Johnn Holley Holley	Remy Natl Remy	Disk Disk Disk	123 112 115	34x4 34x4 34x4	1,385 1,000 1,050	1,385 1,000 1,050	...............	...............
ROSS ...	8-3 x4 1/2	.....	.....	Own	Disk	115	34x4	..... 1,350	..... 1,350	..........	..........
SAXON A B2	4-2x4 6-3/4x4 1/2	A. Kent A. Kent	Mayer .....	..... G & D	Plate Disk	96 113	28x3 32x3 1/2	395 785	..... ..... 785	...............	...............
SCRIPPS-BOOTH C	4-3/4x4	A. Kent	Zenith	Bljr	Cone	110	36x2 1/2	775..........	...............	...............	...............
SPAULDING H	4-4x5 1/2	Simms	Rafid	Entz	Cone	120	36x4	..... 1,000	..... 1,000	..........	..........
S. G. V. J	4-3/4x4 1/2	Bosch	Zenith	W. Lord	Disk	118	34x4	2,200 2,200	2,200 2,200	..........	..........
SIMPLEX 38 50	4-4x5 1/2 4-4x5 1/2	Bosch Bosch	Nwcm Nwcm	Bosch Bosch	Disk Disk	137 137	37x5r 37x5r	All bodies to order All bodies to order	..........	..........	..........
SINGER Six	6-4 x5 1/2	Elsmn	C R G	Wths	Disk	125	36x4 1/2	2,350 2,350	2,350 2,350	..........	..........
SPEEDWELL I	6-4x5 1/2	Wths	Shblr	Wths	Disk	126	37x5	..... ..... 2,350	..... ..... 2,350	...............	...............
SPHINX A-15	4-3/4x5	Spidf	Mayer	Spidf	Cone	113	36x2 1/2	695..........	...............	...............	...............
STEARNS L-4 8-K-4 8-K-6	4-3/4x5 1/2 4-4x5 1/2 6-4x5 1/2	Bosch Bosch Bosch	Shblr Stmbg Stmbg	G & D G & D G & D	Cone Disk Disk	119 127 124	34x4 36x4 1/2 37x5	1,750 2,750 4,850	1,750 2,750 4,850	..... 2,900 5,000	..... 2,900 5,000
STUDERAKER 4-SD 6-E.C.	4-3/4x5 6-3/4x5	Remy Remy	Shblr Shblr	Wagner Wagner	Cone Cone	108 121	32x4 34x4	985 1,335	985 1,335	985 1,430	..... 1,430
STUTZ H.C.S Br. Cat Six T. Car T. Car	4-3/4x5 4-4x5 1/2 6-4 x5 4-4x5 1/2 6-4 x5	Remy Bosch Elsmn Bosch Elsmn	Stmbg Stmbg Stmbg Stmbg Stmbg	Remy Remy Remy Remy Remy	Cone Cone Cone Cone Cone	106 120 120 120 130	32x4 34x4 1/2 34x4 1/2 34x4 1/2 34x4 1/2	1,475 2,000 2,125 2,375 2,400	1,475 2,000 2,125 2,375 2,400	.........................	.........................
TOURNAINE 12	6-4 x5 1/2	Simms	Zenith	Wths	Disk	124	34x4 1/2	2,150 2,150 2,350	2,150 2,150 2,350	...............	...............
TRUMBULL 15-AB	4-3/4x4	Spidf	Brse	W. Lord	Cone	90	28x3	385..........	...............	...............	...............
TWOMBLY ...	4-3/4x4	Spidf	Zephyr	Undee	Cone	120	30x3	690 700	690 700	..........	..........
VELLE 4-45 6-50 Blwl	4-4x5 1/2 6-3/4x5 1/2 6-3/4x5	Bosch Bosch A. Kent	Stmbg Stmbg Stmbg	G & D G & D G & D	Disk Disk Disk	121 126 124	37x4 1/2 37x4 1/2 34x4	1,750 2,615 1,585	1,750 2,615 1,585	1,750 2,615 1,585	...............
VIXEN S.B	4-2x4	A. Kent	Zephyr	.....	.....	106	28x3	385..........	...............	...............	...............
VULCAN ...	4-3/4x5 1/2	Wths	.....	Wths	Disk	120	32x3 1/2	975 975	975 975	..........	..........
WESTCOTT O U	4-3/4x5 6-3/4x5	Delco Delco	.....	Delco Delco	Cone Cone	113 126	32x4 34x4	1,150 1,285	1,150 1,285	...............	...............
WHITE 30 45 60	4-3/4x5 1/2 4-4x5 1/2 6-4x5 1/2	Bosch Bosch Bosch	Own Own Own	Own Own Own	Plate Plate Plate	118 123 1/2 140 1/2	28x4 32x4 1/2 37x5	2,650 All bodies to order	2,650 All bodies to order	2,900 All bodies to order	...............
WILLYS-KNIGHT K-19	4-4 x5 1/2	Simms	Zenith	U.S.L.	Cone	120	36x4 1/2	..... 2,475	..... 2,475	..........	..........
WINTON 21 21A	6-4x5 1/2 6-3/4x5 1/2	Bosch Bosch	Rafid Rafid	Alr or Elec Alr or Elec	Disk Disk	126 123	37x5 36x4 1/2	2,350 2,285	2,350 2,285	2,500 2,285	..........

COMMERCIAL VEHICLES

MOTOR WORLD



The Dealers' National Weekly

Volume XLII
No. 5

New York, February 3, 1915

Ten cents a copy
Two dollars a year

NOTE—The following paragraphs are from an article by Herbert H. Casson, now residing in London, that appeared in a recent issue of *Associated Advertising*.

"Why are there not fifty American drummers in London right now, trying to sell two hundred million dollars' worth of American goods in place of goods that were bought last year from Germany and Austria?

"Why have advertisers become quitters, just at the time when their advertisements were most needed and most effective in cheering on the business forces of the United States?

"If I could afford it, I would charter the 'Mauretania' and 'Lusitania' and convey a party of five thousand American advertisers to Europe for a trip of education. I would give them a week in London, a week in Paris and a week in Antwerp.

"I would let them hear, from fragmentary survivors, the incredible story of battlefields one hundred and fifty miles wide, and armies that are greater than the entire population of Texas.

"Then, when they began to understand, to some slight extent, the magnitude and awfulness of this war, I would say to them:

" 'Now go back and appreciate the United States. Realize your opportunities.

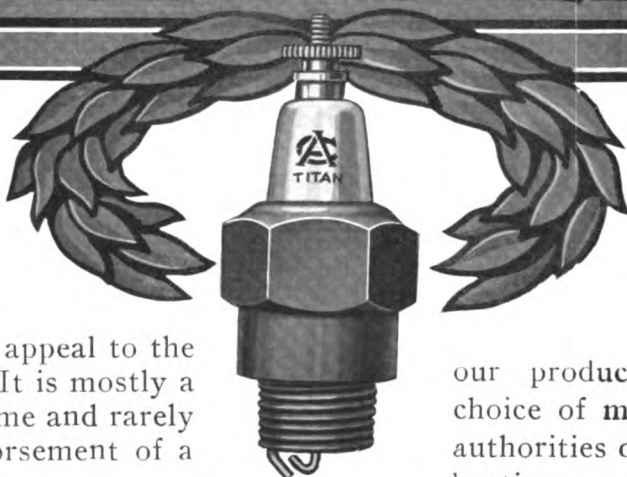
" 'Go back and advertise. Get ready for the most tremendous business boom that any nation ever had. Build your factories bigger. Train more salesmen.' "

FAKES

VERSUS

A-C EFFICIENCY

Freakish spark plug construction is intended, primarily, to appeal to the motorist, like quack patent medicines appeal to the chronic invalid. It is mostly a catch-penny scheme and rarely receives the endorsement of a practical engineer.



AC-TITAN plugs typify the infinite and painstaking degree of accuracy which has made our product the unqualified choice of most of the leading authorities on gas engine combustion.

Improvements in basic design of spark plugs are few and far between, but there are many freakish styles and shapes constantly appearing for which most everything is claimed and nothing proven.

Lack of space prevents our describing in detail the many "catch-penny" arguments advanced by unscrupulous plug manufacturers to stampede the entire industry into the thought that they have accomplished over night that which has taken responsible, dependable manufacturers years to achieve.

What we want to emphasize is the fact that when a new plug is brought out, or a design is changed, extravagant claims are made regarding features of this kind but very seldom is an improvement made to the basic design of the plug; an improvement which will increase efficiency and make the plugs gas tight under all conditions.

AC-TITAN and CICO plugs embody these improvements. Their use insures a smooth running motor at all speeds, eliminates pre-ignition and affords the highest degree of efficiency attained in spark plug construction.

CHAMPION



IGNITION CO.

FLINT · MICH ·

IGAN · U · S · A ·



Price and Quality Must Balance

The quality of the brake lining you sell must be consistent with the price you charge for it, or you will not be able to hold your trade.

This is so—and nobody knows it better than you. That Price and Quality must balance is just as true with respect to net prices as it is with list prices.

What is the Quality of brake linings which list the same as RAYBESTOS, and in some cases higher, but are offered you at a lower net price?

What do you suppose is the lowest net price?

How do you know when you get it?

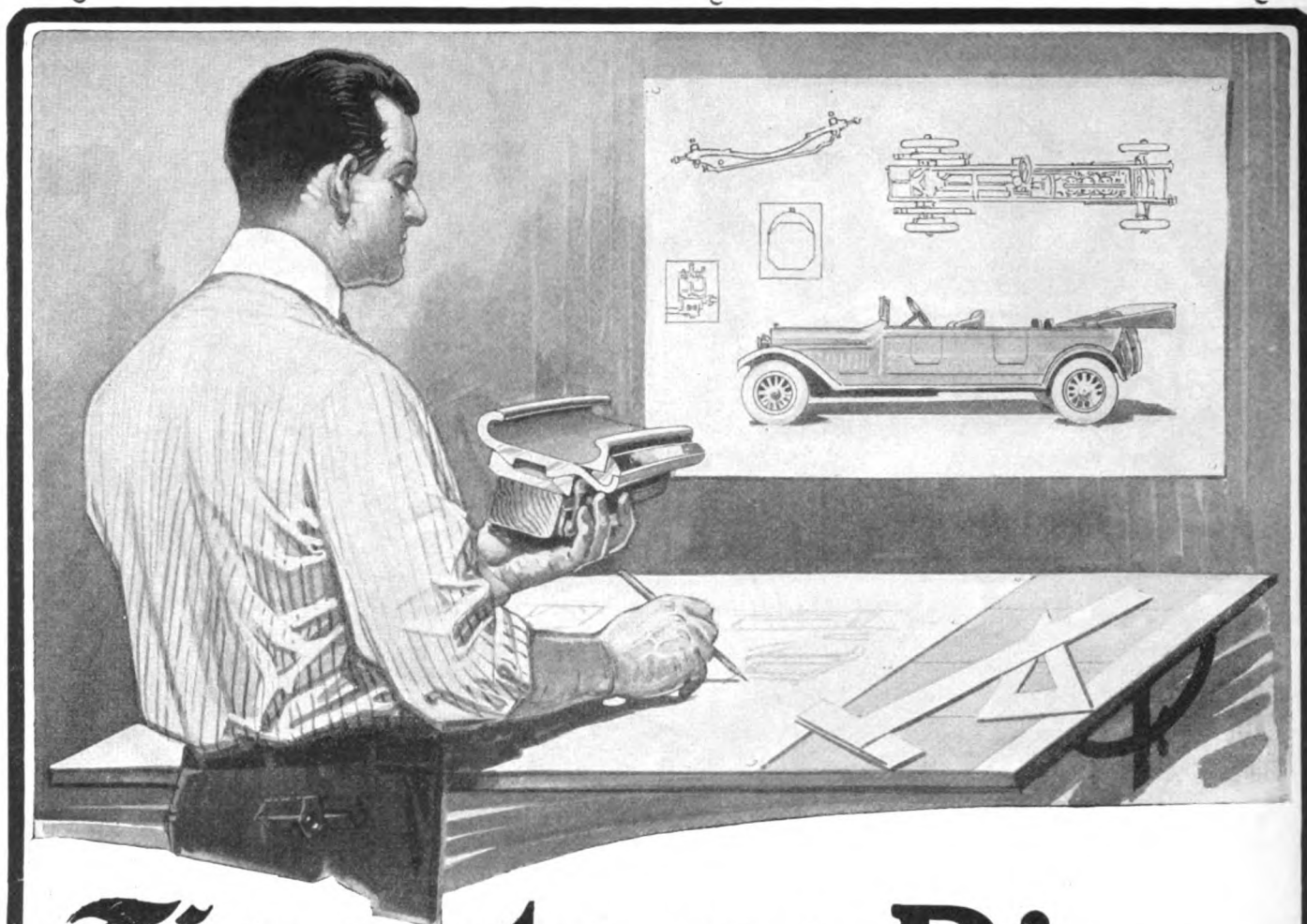
How long before juggled discount prices will affect you?

RAYBESTOS prices—both net and list—are fixed, the same to all—and at all times consistent with RAYBESTOS Quality.

The Royal Equipment Company

1379 Bostwick Avenue

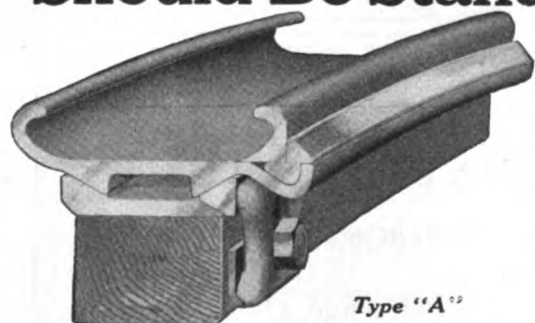
Bridgeport, Conn.



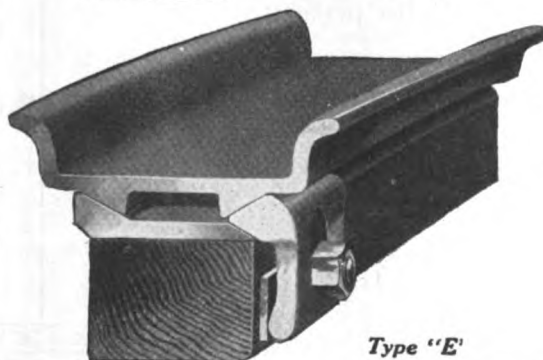
Firestone Rims

Should Be Standard for Your New Model

Because:



Type "A"



Type "E"

- They are the lightest practical rim made.
- Made from the tire maker's standpoint with the tire expert's knowledge.
- Continuous bearing between rim and felloe prevents squeaks and insures correct alignment of rim and tire to wheel.
- Easiest to operate. Tire is easily removed from the rim. No special tools required.
- More car manufacturers use Firestone Rims than all other makes combined.
- 1000 distributing points specializing on Firestone Rims insure service to your customers everywhere.

Write for New Reduced Weights

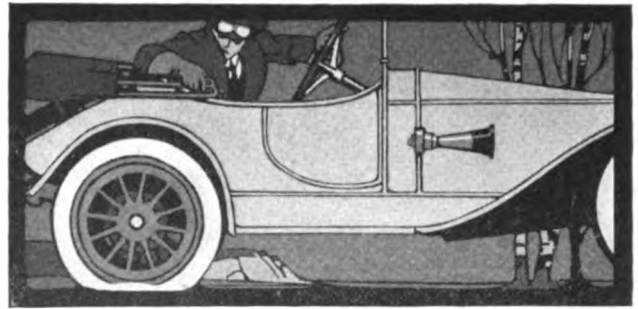
Firestone Tire & Rubber Company, Akron, Ohio

"America's Largest Exclusive Tire and Rim Makers"

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Gone Flat Again!

No sharp report. Just the gradually perceptible jolting that tells of a leaky tube gone flat again. Hot, shadeless road and a dusty, dirty job.

That's the story of the needless puncture so common with cheap, machine-made tubes that leak around valves and become porous in service.

The way to avoid these unnecessary punctures is to equip your car with Kelly-Springfield Tubes, which are made *slowly and painstakingly by hand and out of real rubber*.

Kelly-Springfield Tires are made the same way. Use them with Kelly-Springfield Tubes and you will add increased tire mileage to freedom from needless tube trouble.

Send for "Documents in Evidence" which tells the experience of others

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Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.
The Southern Tire & Repair Co., Houston and Beaumont, Texas
Boger-Stiess Rubber Co., 1208 Hennepin Ave., Minneapolis, Minn.
The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.
The Olmsted Co., Inc., Syracuse, N. Y.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.

L. J. Barth, Rochester, N. Y.
Seifert & Baine, Newark, N. J.
Atkinson Tire & Supply Co., Jacksonville, Fla.
Central Rubber & Supply Co., Indianapolis, Ind.
C. D. Franke & Co., Charleston, S. C.
K. & S. Auto Tire Co., Limited, Toronto, Ont.
Todd Rubber Co., New Haven, Conn.
Barnard-Michael Tire Co., Buffalo, N. Y.





Another One for Overland Dealers

Have you seen the Overland color advertisement in the February Ladies' Home Journal?

In March we add another powerful womans' publication to our advertising list.

From then on, a two page center spread in four colors will appear every month in

The Pictorial Review

This publication has a circulation of 1,001,769.

It reaches every nook and corner in America.

It reaches the best prospects in your territory.

It will help you to "sell" the very people you are working on now.

Mind you, this advertising is in addition to what we are doing right now.

Watch this space for other important announcements.

Handsome catalogue on request. Please address Dept. 50

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, February 3, 1915

No. 5

Wave of Prosperity Follows Chicago Show

**Business Transacted Smashes All Previous Records—
Crowd of 260,000 Passed Ticket Takers During Week**

CROUCHED low behind the wheel of his mighty racer, Prosperity B. Optimism is rushing across the country and he is going very fast. He started from Chicago at 10:30 Saturday night in a blare of horns and shrill of whistles that drowned out the weary shuffling of tired feet toward the Coliseum's door as the greatest business and dealers' show that the motor car industry has ever seen came to a triumphant end.

Tidal Wave of Business Due

This doughty little driver, who has been laid up for a spell, is the impersonation of a wave of business uplift which found expression at the big western show and which is on its way like the ripples when a stone is dropped into a pool. There was far more business done in Chicago than in New York; there were more dealers than at the metropolitan show; and everywhere there was the spirit of Better Times.

Neither was it all talk and generalities. As the show was closing a Motor World representative walked across the littered floor of the Paige exhibit. B. G. Sykes, of the Bird-Sykes Co., which distributes through-

In This Issue

**National Organization of Garagemen
Takes Form**

**Piston Displacement of 8-Cylinder
Motors Tabulated**

**Helping the Accessory Dealer to Dis-
play His Goods**

**Illinois Garage Owners' Association
Adds Dealer Division**

**Reilly's View of the Show Suggests
Helpful Criticism**

**Dealer Dinners of the Past Week in
Story and Picture**

**Many Additions Swell Motor World
Guide**

**Several Tire Lists Tremble on Brink
of Revision**

out Illinois, stood with a slip of paper in his hand. He said:

"We have sold 115 sixes. We have sold 148 fours. We have sold 93 of them retail in the city of Chicago. We sold 170 in the rest of Illinois. That is 263 for the week. We have closed dealers' contracts in the few spots where we were not represented."

Hard Work Helped to Do It

And although not all the figures equal those of Sykes, the story of the whole show is much the same. Especially are the Chicago dealers satisfied. They do not promote the show and they have no claim to the profits, but they have cashed in heavily. The whole Western concentration of the business uplift spirit has been remunerative to them.

Of course it is also the result of earnest selling effort—hard work helped do it, yet the West was out with its money to buy cars—and Alfred Reeves says the motor car industry is

a barometer of true business conditions.

Into one high-priced exhibit an Oklahoma man walked, looked at a sedan, asked a few questions, wrote a check and told them to "send it out right away."

That, of course, is an exception, but it really happened.

Many of the sales were made on the show floor, but most of the dealers maintained a connection between the show and their salesrooms. The show was never so packed before. Literally it was a jam, and to handle many sales it was necessary to convey the prospect to the city salesroom where the atmosphere was more conducive to concentration on the sale. The crowd which made this necessary totaled about 260,000—about 10 or 11 per cent better than the 1914 show.

As for dealers, no one ever knew

there were so many. Certainly, Manager Miles never expected so many of them would go to Chicago. He must have listened to some of those the-show-is-dying-out stories, when he put in an order for 3,500 dealers' admission buttons, for before the week was very old, the 3,500 were gone and the rest of the dealers were admitted on exhibitors' buttons. This represents about 4,000 dealer firms, for but one member of a firm may have a dealer's admission button.

If 10 per cent of them took on new cars, it means 400 new agencies; if each new contract was for 20 cars, it means 8,000 cars, and if each car

averaged \$1,250, it means that the dealer business at the show represents \$10,000,000. This also would mean an average of five dealers to a car, and inquiry indicates that the contracts in several cases are many more than this. Some of the exhibitors state that it will be several days before they will have the results of the show summarized, so great and unexpected was the press of show business.

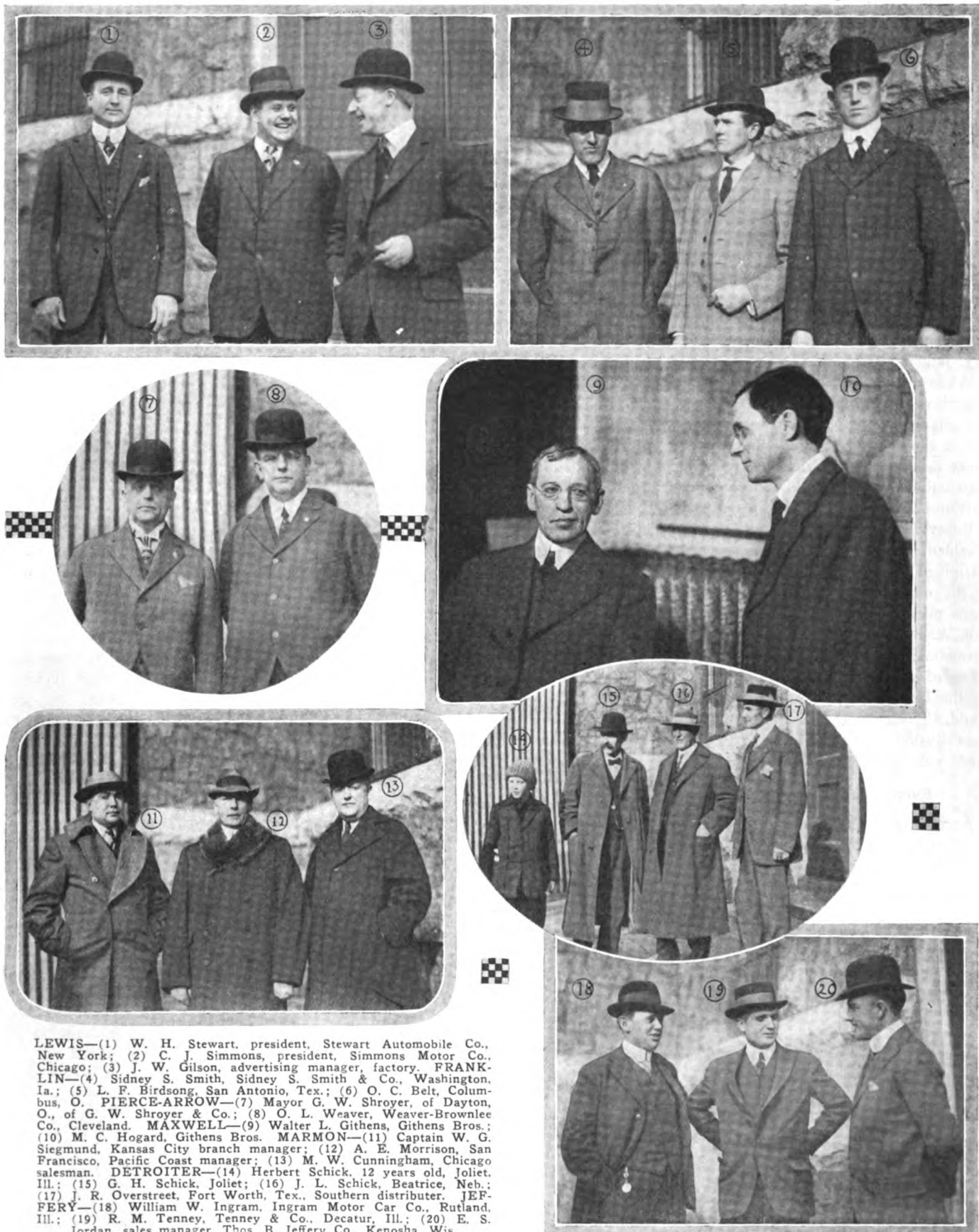
And as for the show dying out, the remark was the occasion for smiles. When the doors were first opened, the crowd fought to get in and throughout the week it never lessened.

Familiar Dealer Faces at Chicago's Mammoth Show



NATIONAL—(1) B. M. Wylie, Indianapolis branch manager; (2) N. A. Eiseman, Eiseman Auto Co., Cleveland; (3) W. A. Schrieber, Schrieber-Borse Motor Co., Milwaukee, Wis.; (4) J. G. Tennant, Tennant Motor, Ltd., Chicago; (5) Louis Lichtie, Lichtie Automobile Co., Toledo, O.; (6) J. M. Clark, sales manager, National Motor Vehicle Co.; (7) L. S. French, advertising manager, National Motor Vehicle Co. **DETROITER**—(8) Frank A. Witt, just appointed sales manager of the Farrington Automobile Co. **STEARNS**—(9) N. T. Hollinshead, president, Western Motor Car Co. **JACKSON**—(10) Ray W. Sherman, Motor World; (11) James Matthews, Capital City Carriage Co., Des Moines, Ia.; (12) C. H. Smallwood, Capital City Carriage Co.; (13) E. V. Chilson, factory representative, Jackson, Mich.; (14) Ora Schuck, Corydon, Ind.; (15) O. P. Copeland, Capital City Carriage Co.; (16) Carl Changstrom, Capital City Carriage Co.

Some of the Dealers Who Traveled to Chicago Show



LEWIS—(1) W. H. Stewart, president, Stewart Automobile Co., New York; (2) C. J. Simmons, president, Simmons Motor Co., Chicago; (3) J. W. Gilson, advertising manager, factory. FRANKLIN—(4) Sidney S. Smith, Sidney S. Smith & Co., Washington, Ia.; (5) L. F. Birdsong, San Antonio, Tex.; (6) O. C. Belt, Columbus, O. PIERCE-ARROW—(7) Mayor G. W. Shroyer, of Dayton, O., of G. W. Shroyer & Co.; (8) O. L. Weaver, Weaver-Brownlee Co., Cleveland. MAXWELL—(9) Walter L. Githens, Githens Bros.; (10) M. C. Hogard, Githens Bros. MARMON—(11) Captain W. G. Siegmund, Kansas City branch manager; (12) A. E. Morrison, San Francisco, Pacific Coast manager; (13) M. W. Cunningham, Chicago salesman. DETROITER—(14) Herbert Schick, 12 years old, Joliet, Ill.; (15) G. H. Schick, Joliet; (16) J. L. Schick, Beatrice, Neb.; (17) J. R. Overstreet, Fort Worth, Tex., Southern distributor. JEFFERY—(18) William W. Ingram, Ingram Motor Car Co., Rutland, Ill.; (19) R. M. Tenney, Tenney & Co., Decatur, Ill.; (20) E. S. Jordan, sales manager, Thos. B. Jeffery Co., Kenosha, Wis.

National Garage Organization Formed

Associated Garages of America Becomes Reality Following Chicago Meeting—Every State Body to be Represented—Bland Is Elected to the Presidency



Robert Bland, of Evanston, Ill., newly elected president of the Associated Garages of America. Bland is former president of the Garage Owners' Association of Illinois and has been one of the leaders in the organization work which has brought about the formation of the national garage body

THE Associated Garages of America, the national association of garagemen for which the Illinois garagemen have been working for several months, was organized in Chicago last Thursday, January 27.

While not all the states which contain organizations were represented in person, many have cooperated in the work, and it is expected that it will be but a short time before the roster of member associations will assume gratifying proportions.

Robert Bland, Evanston, Ill., former president of the Garage Owners Association of Illinois and one of the leaders in the national organization work, was made president without opposition.

F. A. Beane, president of the Detroit garagemen, was named treasurer; the office of secretary was made appointive by the Board of Directors. William L. Rudd, Chicago, one of the fathers of the organization movement in the West, was made vice-president.

Every State Represented

According to the plan of organization each state will have two directors and a vice-president; where a state is not organized the naming of the directors lies with the president. The vice-presidents thus far named are:

New York—William Haradon, Royal Garage, New York city.

Illinois—John A. Cameron, Chicago, and Charles L. Turner, Peoria.

Michigan—L. C. Steers, Detroit; 518 Garage.

Ohio—F. E. Avery, Columbus; F. E. Avery & Son.

Iowa—N. T. Miller, Des Moines; secretary of the Iowa Automobile Business Association.

Colorado—M. Foster, Denver; of W. W. Barnett.

These half-dozen states are the nucleus. A resolution was introduced whereby any garageman who has joined or believed he joined any garage or-

ganization without a full understanding of what he was doing and who desires to affiliate with the Associated Garages of America may, upon surrendering his membership in the organization with which he is dissatisfied, become a member of the national body without the payment of further fees.

This action followed the organization of at least one corporation by a garageman and which the Illinois association does not look upon with favor; they allege that the name of his organization is a misnomer and that he is operating the business for his own profit. He has secured quite a few members in the Middle West. The same provision covers any state where a movement is promoted but with which the garagemen become dissatisfied after investigation. The resolution was passed unanimously.

Enlarge Purchasing Committee

L. C. Steers, Detroit, proposed that the Purchasing Committee of the Garage Owners' Association of Illinois be requested to act temporarily as the purchasing committee of the national association and that it be requested to extend its work into other states. This was done. There are under consideration several plans for securing supplies for the garagemen at reduced prices.

A vote of thanks was extended to Secretary E. J. McGuirk of the Garage Owners Association of Illinois for his work in bringing the convention about. The Illinois association's attorney, Frank H. T. Potter, was made the first honorary member of the organization.

It was voted to hold the next convention in Chicago during the automobile show; the by-laws provide that each convention shall select the place of the following meeting.

The convention followed directly that of the Illinois association and both were concluded Thursday evening by a banquet in the banquet hall of the Lexington Hotel. President Bland acted as

toastmaster and addresses were delivered by retiring President John A. Cameron of the Chicago Garage Owners Association, President-elect H. E. Halbert of the Chicago association; President-elect W. B. Taylor of the Illinois association, Charles L. Turner, Peoria, state treasurer; Harry Salvat, Chicago secretary; William L. Rudd, national vice-president; Jacoby C. Le Bosky, representing the Governor of Illinois, and H. N. Tolles, of the Sheldon school.

Will Organize by States

The secretary of the association will at once get in touch with unaffiliated state organizations and will institute organization in unorganized states.

Manufacturers may become associate members of the organization. It was proposed that the names of city, county and state organizations which aim to, affiliate follow this style: Garage Owners Association of Illinois, Rockford County Garage Owners Association, Chicago Garage Owners Association.

For individuals the dues are \$5 a year; for individuals paying through a county association, \$3; for individuals paying through a state association, \$1.

A majority of the delegates present constitutes a quorum; the directors are the nominating committee, but other nominations may be made by a petition signed by 15 delegates; the by-laws may be amended by a vote of two-thirds of those present.



DINNER AT THE LEXINGTON THAT WOUND UP THE NATIONAL GARAGE OWNERS' CONVENTION

(1) John A. Cameron, Chicago; (2) R. C. McPherson, Chicago; (3) Mrs. Cameron; (4) W. B. Taylor, Rockford, president elect, Garage Owners Assn. of Ill.; (5) J. C. Sanders, warden, Iowa State Penitentiary; (6) Parker H. Sercombe; (7) Jacoby C. LeBosky, representing Governor Dunne of Ill.; (8) Robert Bland, Evanston, retiring president, Illinois Association; (9) Mrs. Bland; (10) H. N. Tolles, Sheldon school; (11) Mrs. Tolles; (12) H. E. Halbert, president, Chicago Garage Owners' Assn.; (13) Mrs. Halbert; (14) K. Lucius Taylor, Chicago; (15) Mrs. Taylor, manager, Campbell Ave. Garage, Chicago; (16) William Rudd, Chicago; (17) Miss Jennie Nichols, manager, Colorado Garage, Chicago; (18) Mrs. G. H. Steinick, manager, Fifth Ave. Garage, La Grange, Ill.; (19) Mrs. H. G. Williams, Evanston, Ill., manager, Evanston Garage; (20-21) Mr. and Mrs. E. B. Collins, Danville, Ill.; (24) N. T. Miller, secretary, Iowa Automobile Business Association, Des Moines; (25) May M. Smith, Peoria, Ill.; (26) George Smith, Peoria; (27) J. R. Warner, Ladd, Ill.; (28) A. K. Boyd, Ladd, Ill.; (29) Matthew Knauff, Ladd, Ill.; (30) T. M. Woolson, Chicago; (31) J. L. Woolson, Chicago; (32) C. E. Crone, Chicago; (33) Milton Davis, Chicago; (34) Mrs. Charles L. Turner, Peoria, Ill.; (35) Charles L. Turner, treasurer, Garage Owners' Assn. of Ill.; (36) Mrs. W. L. McDowell, chairman, Chicago Section E. V. A.; (38) Mrs. C. E. Stapp, Peoria; (39) C. E. Stapp, Peoria; (40) Arthur Marvin, El Paso, Ill.; (41) E. A. Maus, Mendotte, Ill.; (42) F. W. Greusel, Rockford, Ill.; (43) M. J. Rose, Chicago; (44) Mrs. M. J. Rose; (45) Ray W. Sherman, Motor World, New York; (46) E. J. McGuirk, secretary, Garage Owners' Assn. of Ill.; (47) B. G. Motter, Peoria; (48) Harry Salvat, secretary, Chicago Garage Owners' Assn.; (49) William Jones, Jones Fashion Garage, Chicago

Buick Dealers From Afar Gather for Chicago Show



(1) H. J. Kinney, Indianapolis; (2) W. H. Hutchings, Kansas City; (3) C. F. Yonkers, traveling representative; (4) A. J. Morris, Peoria, Ill.; (5) George A. Birum, Osage, Ia.; (6) H. E. Loomis, Indianapolis, Ind.; (7) M. Wiggle, New Castle, Ind.; (8) Fred A. Sperry, Bushnell, Ill.; (9) W. J. Harter, Keokuk, Ia.; (10) C. D. Roberdee, Iowa City, Ia.; (11) E. H. Sidwell, Iowa City; (12) Paul Jones, Stockton, Ill.

L. C. Steers, Detroit, told of the work that has been done there; an ordinance removing curb pumps was defeated and concessions were secured on gasoline storage restrictions. Aside from the organizations connected with the work these men are listed as workers in the national project:

B. S. Jordan, Little Rock, Ark.; W. F. Parker, Meriden, Conn.; A. C. Kendall, Pasadena, Cal.; G. Norman, Tampa, Fla.; G. C. Frissell, Miami,

Fla.; W. E. Carson, Peru, Ind.; J. W. Fieldhouse, Elkhart, Ind.

Jacob Friedman, Dyersville, Ia.; Ernest W. Brown, Des Moines, Ia.; D. W. McAuley, Mason City, Ia.; W. H. Imes, Topeka, Kans.; Graeme G. Batts, Louisville, Ky.; Turner-Wilkinson, Shelbyville, Ky.

John D. Mains, Hagerstown, Md.; Adams & Hart, Grand Rapids, Mich.; J. E. Eberly, St. Joseph, Mo.; John N. Taylor, Columbia, Mo.; Frederick E. Murphy, Minneapolis, Minn.

Edwards Auto Co., Plainview, Minn.; Ed S. Curtice, Meridian, Miss.; A. F. Hagar, Buffalo,

N. Y.; H. C. Price, Binghamton, N. Y.; J. L. Howard, Charlotte, N. C.; Robt. Crawthens, Cincinnati, O.

Guy C. Stoltz, Marion, O.; Frank C. Riggs, Portland, Ore.; W. C. De Forest, Sharon, Pa.; J. C. Bartlett, Philadelphia, Pa.; E. S. Musser, Lancaster, Pa.; Buford Adams, Fort Worth, Tex.

H. E. Kors, Wichita Falls, Tex.; E. F. Davis, Brenham, Tex.; E. A. Kemmerer, Janesville, Wis.; C. Hofweber, La Cross, Wis.; Frank Foska, Green Bay, Wis.; Rummele Auto Co., Sheboygan, Wis.; R. Moeller, Milwaukee, Wis.

Illinois Garage Owners' Association Adds Division for Dealers

Will Assist the Garageman Who Is Also a Dealer in Solving His Problems

THE convention of the Garage Owners Association of Illinois, held Tuesday and Wednesday last week, January 26 and 27, moved with the regularity of an organization which has reached a point of stability and firmness.

There were numerous matters of minor importance and several addresses by prominent speakers, but several things stand out with importance. The Purchasing Committee's work is one of the topics of chief interest at the present time and this division stated that it was considering the advisability of establishing an office in Chicago with a permanent manager whose duty it would be to conduct the purchasing for the association and arrange for shipments and payments. This man would be under the control of the Board of Directors. The committee, however, stated that it expected definite results in 30 days. George A. Wallace, Chicago, and H. G. Williams, Evanston, were added to the committee.

The Dealers Division in the garage association, which, as was told in Motor

World, was proposed at the Peoria convention in October, was made a reality; this is for the handling of the problems of the garageman who is also a dealer. J. C. Thorpe, Urbana, Ill., who was the father of the idea, was made chairman of the Dealers' Division. A. E. Hoffman, Danville, is vice-chairman. J. L. Murray, Bloomington, was made secretary of the division, which office also carries the title of assistant secretary.

W. B. Taylor, Rockford, who has brought his garage from an unsystematized condition into a systematized and properly accounted condition, explained the system under which he operates.

Chairman Harry Salvat of the Good Roads Committee reports that he had attended many meetings and has plans for further prosecution of this branch of the work.

Chairman W. B. Taylor of the Garage Rates Committee said that instead of 50 cents a night for storage the rate should be 75, basing his assertion on what he has learned from the accounting of his own business.

That there is a possibility of a uniform insurance rate was reported by Chairman R. C. McPherson of the Insurance Committee. Rates have been far from uniform, but he said the committee is negotiating with a mutual company and expects results soon.

Hereafter, instead of four conventions a year, there will be two, one in Chicago during the show and the other in some other Illinois city in July.

The per capita tax, which is the state body's assessment on individual members, is to be levied hereafter January 1 and July 1 on members in good standing. Heretofore there was no provision as to when it should be levied.

The officers chosen are: President, W. B. Taylor, Rockford; vice-president, John McNeil; treasurer, Charles L. Turner, Peoria; secretary, E. J. McGuirk. Directors, A. C. Hood, Sparta, and Robert Bland, Evanston. An address was delivered Wednesday morning by Comptroller L. E. McGann of Chicago. Mayor Carter H. Harrison was made an honorary member.

Dealers Break Bread Together

Overland Starts Ball Rolling and Chalmers, Dodge, Saxon, Franklin, Reo and Others Follow

NO matter what else the Chicago show may do it is the cause of a host of dealers and factory dinners. The biting breeze from Lake Michigan evidently sharpens the appetites of the visiting motor car men and augments their speech-making proclivities, for there was hardly a minute that somebody wasn't having a dinner, a luncheon, or a banquet.

Overland started the ball Monday night at the La Salle, and the same evening the White Co. held a buffet meeting in the Annex; this was largely an informal sales talk and lunch.

Tuesday and Wednesday Busy Days

Tuesday noon there was a Chalmers session and lunch at the Auditorium, at which various policies and problems were talked over. The same noon the Chicago Division of the Electric Vehicle Association met at the Metropole, and that evening after the show the Electrolytes, who are the merry-makers of the E. V. A., met at Kramer's.

Wednesday at 1 P. M. the Dodge

dealers dined in the Railroad Club in the Karpen building; the same noon the garagemen at their convention were dined by the Commonwealth Edison Co. at the Metropole. At 6:30 the Saxon men ate in the Annex, and at the same hour and place the Franklin dealers dined. In the Railroad Club at 6:30, E. P. Chalfant, of the Electric Automobile Manufacturers Association, addressed a number of electric dealers and garagemen. At the same hour, but in St. Hubert's cafe, the Rich Tool Co. entertained a party of tradesmen.

Trade Association Dines Thursday

The Reo dealers were banqueted in the Annex the same evening, and the Ford dinner that night at the Sherman House was one of the largest held. Wednesday the Mitchell took a party of dealers to the factory in Racine, where they were entertained all day.

The Chicago Automobile Trade Association started Thursday's program with a dinner to visiting dealers at the Chicago Athletic, explaining its Central

Used Car Market Report. Jeffery dined at the Congress at 7 in the evening; Crow held a sales meeting at 10:30 in the Annex; King's dinner was in the Metropole; the garagemen banqueted at the Lexington; Paige met at the Metropole; the Thermoid western men dined, and there were other smaller and more exclusive parties.

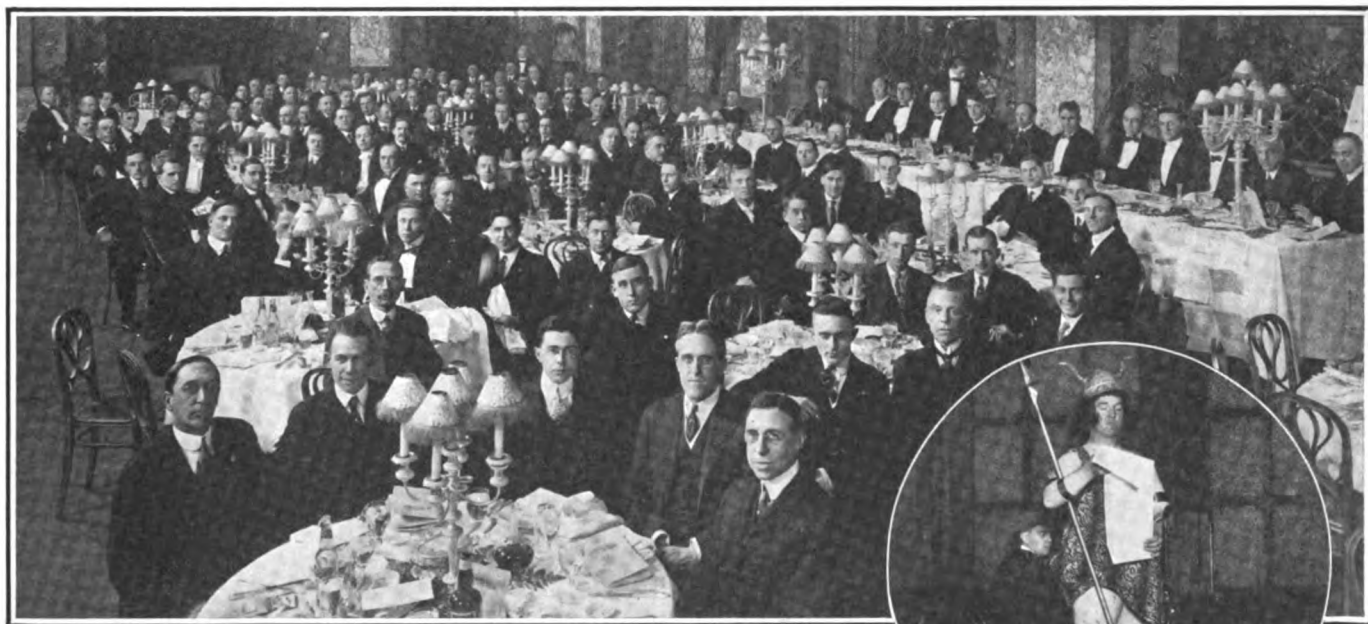
FRANKLIN DEALERS' PROBLEMS DISCUSSED AT SHOW DINNER

The problems of the dealer were threshed out in a heart-to-heart manner that developed valuable points at the Chicago dinner of the dealers of the Franklin Automobile Co. in the Annex. Sales Manager Arthur Holmes presided and was aided in conducting the experience meeting by W. J. Donlan, the company's advertising counsel.

Dealers Exchange Experiences

All the dealers were requested to write upon slips of paper the things they regarded as their greatest problems; these were then taken as topics for discussion and the dealers were asked for their solutions of the question at issue. In this way the very excellent solution worked out by some one dealer was made available for all. There were no set addresses, but the discussion was intensive.

Saxon Dealers Dine at Annex While Saxon Car Runs Around the Tables



At the speakers' table at the Saxon banquet were the following: (1) N. E. Wheeler, Minneapolis; (2) Geo. A. Bönd, Kansas City; (3) Laurence Moore, director of sales; (4) C. A. Pfeiffer, Saxon Co.; (5) William Maxwell, New York; (6) President H. W. Ford, Saxon Co.; (7) David Beecroft; (8) James Levy, Chicago; (9) C. C. Cross, factory manager; (10) C. W. Payne, Des Moines; (11) Carl M. Green; (12) J. Y. H. Mitchell. A Saxon car was driven

around the hall carrying the figure of a Saxon warrior

The Paige-Detroit Motor Car Company's Dinner at the Metropole Was a Big One



Among the prominent men at the speakers' table at the Paige-Detroit Motor Car Company's dinner, held at the Metropole, were the following: (1) H. M. Jewett, president of the Paige-Detroit Motor Car Company; (2) James F. Bourquin, general manager of the Paige-Detroit Motor Car Company; (3) "Doc" Payne, distributor of Paige-Detroit cars for Des Moines, Iowa; (4) George H. Bird, of the Bird-Sykes Company, Chicago distributors for the Paige-Detroit cars; (5) B. G. Sykes, of the Bird-Sykes Company; (6) R. D. Rockstead, Milwaukee distributor of Paige-Detroit cars; (7) Vice-President Judson of the Continental Motor Manufacturing Company; (8) Don Lee, Paige-Detroit distributor in Los Angeles, California

The Jeffery Dinner Was Held at the Congress



(1) E. G. Seward, territorial manager for the factory; (2) L. H. Bill, general manager, factory; (3) George H. Bryant, advertising counsel; (4) David Beecroft; (5) A. M. Robbins, Chicago Jeffery dealer; (6) J. K. Bond, manager of the truck department; (7) O. G. Forhmals, office manager, factory; (8) P. J. Downes, Minneapolis Jeffery distributor; (9) Prince Wells, Louisville, Ky., Jeffery distributor; (10) W. W. Ingram, Rutland, Ill.; (11) R. M. Tenny, Decatur, Ill.; (12) J. S. Joslin, Rockford, Ill.; (13) L. G. Martin, Pittsburgh Jeffery distributor

Chalmers Dealers Who Gathered at the Auditorium



Chalmers Dinner Well Attended

Following is a complete list of the dealers at the Chalmers luncheon:

G. R. Wood, Tanberg Auto Co., Eau Claire, Wis.; Ferd Sheagren, Sheagren-Hunt Co., Burlington, Ia.; V. W. Reynolds, Des Moines, Ia.; A. E. Gronau, Des Moines, Ia.; W. L. Farr, Des Moines, Ia.; James Brown, Creston, Ia.; M. T. Tostenson, Marshalltown, Ia.

H. E. Lucia, Green Bay, Wis.; W. L. Topf, Marshalltown, Ia.; J. S. Losee, Hebron, Ill.; C. P. Hatter, Milwaukee, Wis.; R. B. Hansel, Galesburg, Ill.; D. W. Jones, Columbus, O.; W. J. Miller, Columbus, O.; F. N. Schwab, Chicago, Ill.; D. J. Canara, Chicago, Ill.; S. L. Allen, Chicago, Ill.

C. F. Mason, Davenport, Ia.; D. Van Wynn, Davenport, Chicago, Ill.; P. M. Lattner, Cedar Rapids, Ia.; J. A. Lattner, Cedar Rapids, Ia.; W. Engelman, Cedar Rapids, Ia.; Carl M. Green, Detroit, Mich.; E. M. Purcell, Greenwood, Miss.

Edw. J. Thurber, New Orleans, La.; H. A. Wetmore, Sioux City, Ia.; J. W. Burkitt, Jr., Arlington Heights, Ill.; H. R. Boston, Chrisman, Ill.; Chas. Holden, Chrisman, Ill.; J. B. Deibler, Chicago, Ill.; Chas. J. Durheim, Mus-

kegon, Mich.; Nels A. Fruland, Ottawa, Ill.; John H. Claussen, Crown Point, Ind.; H. S. Howlett, Chicago, Ill.

E. N. Bunnell, Hammond, Ind.; Leo H. Lux, Wadsworth, Ill.; J. H. Maher, Chicago, Ill.; Matt Knauf, J. Add, Ill.; O. B. Hoem, Wadsworth, Ill.; W. H. Flihr, Virginia, Minn.; Henry T. Parrett, Wenona, Ill.; D. Parrett, Wenona, Ill.

Clifford S. Slonneger, Morton, Ill.; H. A. Townsley, Akron, O.; G. C. Keck, Mt. Vernon, Ind.; J. F. Charley, Evansville, Ind.; J. L. Fidler, Champaign, Ill.; W. G. Shell, Farmer City, Ill.; W. Williams, Bloomington, Ill.

J. D. Connell, Denver, Col.; H. T. Heberle, St. Paul, Minn.; E. B. Collins, Danville, Ill.; Andrew Auble, Akron, O.; Jos. H. Greenwald, Cleveland, O.; E. J. Filiatrault, Duluth, Minn.

Jos. J. Barclay, Minneapolis, Minn.; A. B. Fridaker, McGuffey, O.; T. G. Beck, Saginaw, Mich.; F. A. Orr, Independence, Ia.; Frank Bryant, Waterloo, Ia.; C. E. Mulford, Independence, Ia.; W. L. McCloud, Sheldon, Ill.; O. L. McDaniel, Sheldon, Ill.

H. H. Collier, Belvedere, Ill.; Fred Neumeister, Rockford, Ill.; Jos. Even, Dubuque, Ia.; L. R. Dohrn, Anamosa, Ia.; E. J. Boud, Cedar Rapids, Ia.; L. W. Palmer, Cedar Rapids, Ia.

E. A. Beecher, Colorado Springs, Col.; Geo. H. Schollenberger, Wichita, Kan.; John Pirie, Kansas City, Mo.; J. E. Eberly, St. Joseph, Mo.; B. J. Willisen, Calumet, Mich.; Paul Pawler, Calumet, Mich.

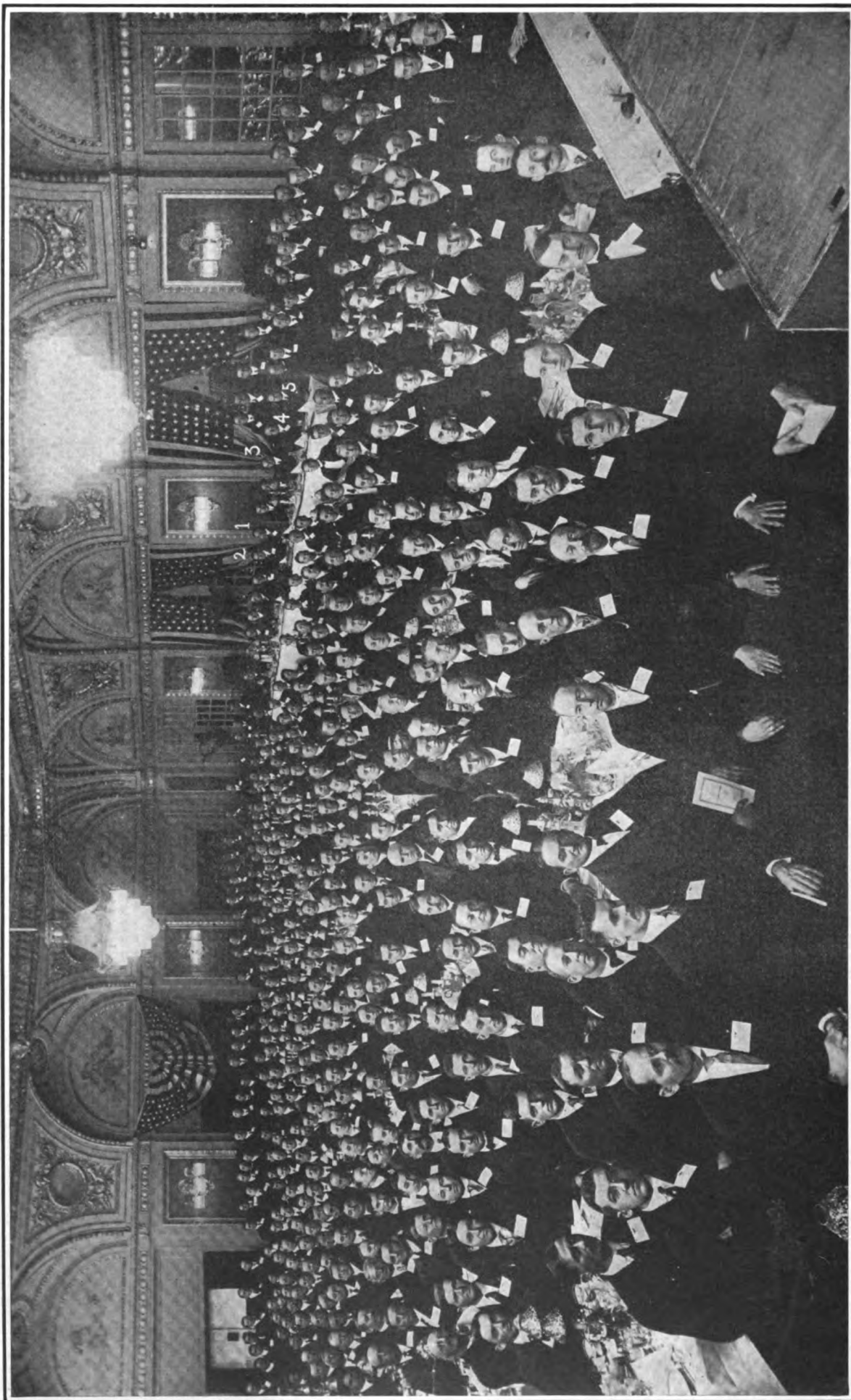
V. E. Jessup, Hannibal, Mo.; Edward Lawrence, Joliet, Ill.; F. S. Weir, Monmouth, Ill.; S. S. Primm, St. Louis, Mo.; T. C. Nichols, Quincy, Ill.

G. K. MacEdward, Detroit, Mich.; Jerome P. Parker, Memphis, Tenn.; Wm. T. Wehnstedt, Winnetka, Ill.; Jos. H. Dillon, Winnetka, Ill.

R. H. Sterling, Buffalo Center, Ia.; R. A. Morton, Mason City, Ia.; F. D. Daniels, Mason City, Ia.; O. H. Bradway, New Castle, Ind.; Wilkins Seacord, Jr., Galesburg, Ill.; G. F. Toozer, Omaha, Neb.; H. H. Taylor, Hutchinson, Kan.

A. R. Markley, Estherville, Ia.; C. H. Hatch, Fort Dodge, Ia.; J. H. Waterman, Fort Dodge, Ia.; L. J. Schultz, Chenoa, Ill.; C. W. Williams, Bloomington, Ill.

F. P. Jones, Farmer City, Ill.; B. L. Pierce, Jonesboro, Ind.; A. T. Mosher, Indianapolis, Ind.; Jno. A. Boyd, Indianapolis, Ind.; L. E. Reed, Charles City, Ia.; G. Vernon Beck, Factory District Manager.



Among the prominent men connected with the Ford company, grouped at the speakers' table, are the following: (1) N. A. Hawkins, manager of sales, Ford Motor Company; (2) Assistant Manager of Sales Ryan, Ford Motor Company; (3) Atlanta Branch Manager Abbott, Ford Motor Company; (4) Pittsburgh Branch Manager Dunbar, Ford Motor Company; (5) Kansas City Branch Manager Meade, Ford Motor Company

Sticking to System is Necessary for Success

Chicago Show Furnishes Reilly Text for Discourse on Methodical Work vs. Work That is Otherwise

By Ray W. Sherman

BELIEVE me!" Tommy Trumbull gazed out the door of the salesroom of C. J. Reilly, Inc., at the dry street upon which the sun shone down with warmth and gladness. "Little old last year's Callawassa looks good to me this morning!" he continued. "Gee! But it was cold!"

"Cold?" questioned Charley McGrain, whose job as sales manager for Reilly consisted in managing Tommy.

"I shiver when I think of it," replied the dapper little man, and he shuddered with a shudder which to all appearances was of a very bona fide variety.

"And Sam Miles's back alley! Gee! Every time I went from the Coliseum to the Armory I thought I'd die! Thank heaven I took my old overcoat instead of that new raincoat!"

Tommy turned to his morning's work. It was Monday and he was just back from the big western show. Reilly—busy downtown probably, or else late in rising—had not yet arrived. If there was one thing Tommy hated it was a shivering blast of Lake Michigan breeze which went skimming up and down his spine like that spider of somebody-or-other's that staggers across the moving picture screens. Presently Reilly breezed in.

A Funny Thing Reilly Saw

"Well, well!" Reilly was full of his Monday morning vim. He hitched his coat to the coat-tree and scattered Good mornings. Charley had to be told all about the show, who was there, what happened, what they did besides see the cars, and all the little details.

"I saw one funny little thing," announced Reilly, just after he had turned to the pile of private-looking mail which had piled up during his absence.

"Yes?" asked Charley, and Tommy silently waited to hear what it was. He wondered if he had seen it, too—and if it was funny.

"It was in the Congress exhibit——"

"Good exhibit?" asked Charley.

"Yes, fine!" chorused both the late show-goers.

Reilly continued: "I dropped around there to see how they were getting on

and I ran across Bludgett, from Oklahoma City. You remember him, Charley; he was in at one of the dealer meetings at the factory last summer."

"Oh sure!" said Charley.

"Bludgett and I stood there talking of things in general and watching that pushing, jamming crowd rubber at the cars when the new advertising manager at the factory blew into the booth. He took one look at the situation and went up in the air; he didn't make much noise about it, but he was powerful excited inside. Anyone could see that."

Hated to See Men Standing Around

"What was the matter?"

"Why——" Reilly leaned back and laughed. "He apparently didn't think they were running the exhibit right, and I don't think they were. He said they were the most disorganized, inefficient, not-get-anywhere gang he ever saw outside of an unbossed section gang. He began ordering the salesmen around—and the funny part of it was they stood for it with the appearance of realizing that he was right and had it on them."

"He first wanted to know who was in charge of the exhibit. They told him that Johnny Husey was; he asked Husey why they weren't getting in touch with the people who walked into the exhibit instead of standing around like a lot of manikins. Husey said they were. The advertising man said they were not and proceeded to tell them why not and how to do it."

What's the Value of an Idle Man?

"I had noticed that not more than one out of every ten or fifteen people who entered the exhibit was approached by a salesman, and in half those cases the salesman didn't volunteer to talk to the prospect; the prospect asked the salesman and the salesman couldn't do anything but answer the question."

"This ad man told them to get out of the back of the exhibit and stick around near the front unless they had someone to talk to and needed to get to the back of the space where it was quiet. He told them to get out on the firing line and watch for a chance to volunteer an an-

swer to some semi-question of a visitor; to make an opportunity to answer questions, and at least keep busy even if it was hard work and didn't seem to get them anywhere."

"One of the salesmen said he could stand out there and talk his head off and it wouldn't do any good; the people, he said, were simply rubbering and wouldn't buy cars. Then the ad man flew up in the air again and asked the salesman about what he thought he was worth an hour standing around behind the cars. There wasn't much of a comeback to that and the salesman got busy. The ad man said it probably was hard work plugging through a week of show, but that inasmuch as the company was spending money for the space and hoped to get some good out of it the salesmen ought at least try to get the names of a few prospects."

"Another thing he yelled about was the way they planned their time."

Where They Did Things on Schedule

"How did they plan it?" asked Tommy.

"They didn't plan it," laughed Reilly. "They cooperated on this time question like a couple of calves tied to a rope. The ad man had arrived just about supper time, and whereas they had a force of eight salesmen when they were all there, there were but two in the place. And the crowd was just beginning to throng back and it was too much for the two men anyway."

"He said they ought to lay out some sort of schedule and have enough men there all the time to handle the business. He laid it out roughly on a sheet of paper and told Husey he had better dope out a scheme like that and get some system under his hide."

"That is good dope," replied Charley.

"It was some different in the June space; I dropped over there to see an old friend of mine who is on their selling staff and I asked him to go to dinner with me. He pulled a sheet of paper out of his pocket and said he couldn't go for a half hour; I asked him why and he showed me the staff schedule for the whole week from opening time to closing time."

"It was fine!" enthused Reilly. "There was the whole business in black and white and nobody could go wrong on it. Every salesman had a copy and it not only told him where he was supposed to be and when, but also told him the same thing about every other man in the organization. It was laid out so that during the slackest part of the supper hour the salesmen were fewest, but as the crowd began to come back the salesmen were scheduled to return, and by the time the crowd was back in numbers every man was on the job."

Basketball Tactics in Selling

"It wasn't a hard schedule, either. Every man had plenty of time to eat and take a smoke afterward, too, if he wanted to. It even called for the presence of a man or two all the time in the downtown salesrooms. It must have saved somebody a lot of figuring and worrying. The manager was able to devote his whole attention to other things with the full knowledge that if the salesmen kept to schedule the exhibit would be well handled."

"He explained to me while we were at dinner that they had instructions to alternate at the front of the exhibit and watch out where they stood—just like a basketball team. If one salesman found it necessary to move over near where another salesman stood, and if the second salesman wasn't talking to anyone he moved away and filled in a vacant spot somewhere near where the other man had been. They kept scattered around that way and there wasn't a spot in the exhibit that a visitor could breathe a question that there wasn't a salesman right behind him to answer it."

"Gee! That was great, wasn't it?" beamed Charley.

Planning Easiest as Well as Best

"It sure was!" replied Reilly. "And the same thing is just as applicable outside a show as in. Of course, with you and Tommy here together there isn't much friction and most of the time there is but one of you here, but where more than one salesman is kept on the floor there ought to be some sort of teamwork of this description. It ought to be understood that certain men are to go to meals about a certain time and that the place is never to be left deserted. There ought to be some sort of teamwork, too, of the type that kept the June men scattered all over the exhibit. There is nothing worse in basketball than having all your men bunched up in one spot—and the same thing applies to a force of salesmen."

"Yes, I guess that's right," admitted Charley.

"I'll tell you, boys," continued Reilly, "when you get out of here and in some better job never forget that planning is what gets results. You can do more and with less effort if you plan than if you go it hit-or-miss. How do you suppose that Congress sales manager would stand if the big smokes at the factory appreciated how inefficient was his arrangement and handling of their exhibit? The chances are they think he is pretty fair and that he is getting away with it on the strength of his showing, but the day is coming and is not far away when the salesmanship of today is going to be a back number and the men who lead and make the greatest successes are the men who are sales scientists; they will be far and away above what the average salesman of today is."

Think Before Starting to Work

"You don't always expect to stay with me. You can't if you're going to progress. There are bigger and better fields and when either one of you gets a chance to get something better, far be it from me to attempt to discourage you; I should hate to lose either of you, but I think too well of you and you have done too well by me for me to block your progress. The only thing I ask is that you give me a nice long notice and part friends."

"But this is what I wish to emphasize: whatever you do, study planning. Be

systematic. If you have a task before you don't jump into it without looking; stop a minute and formulate a plan and then stick to the plan. That will get you where you aim to go quicker than any other thing you can do. You wouldn't start to build a house without a plan, and you wouldn't expect a man to build a railroad without the proper surveying; and neither should you attempt to be big men in sales work unless you carefully and studiously plan and then plug ahead on that plan for all you're worth."

Charley Calls Off War Talk

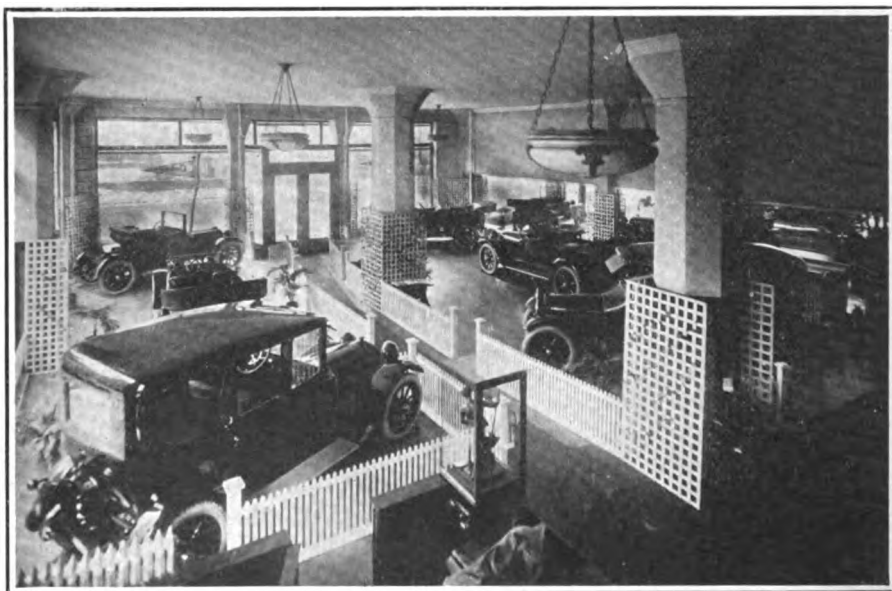
Both the salesmen were thoughtful. Charley for quite a while had been investigating certain openings, but he had not taken Reilly into his confidence. He was just about to unburden himself when Reilly added:

"I think one of the best examples on a man who made good on a plan was old Von Moltke in the war of 1870. When war came he had the plans in a pigeon-hole in his desk; all that was necessary was to follow the plans—and the Germans won. They had planned in this war, too, but so had the other nations, and this has made them on a more even footing and the contest is not over—"

"Nix on the war," said Charley. "We're neutral."

"Yes," added Tommy. "French, German, English and Irish—they're all wrong, but those allies are some scrappers."

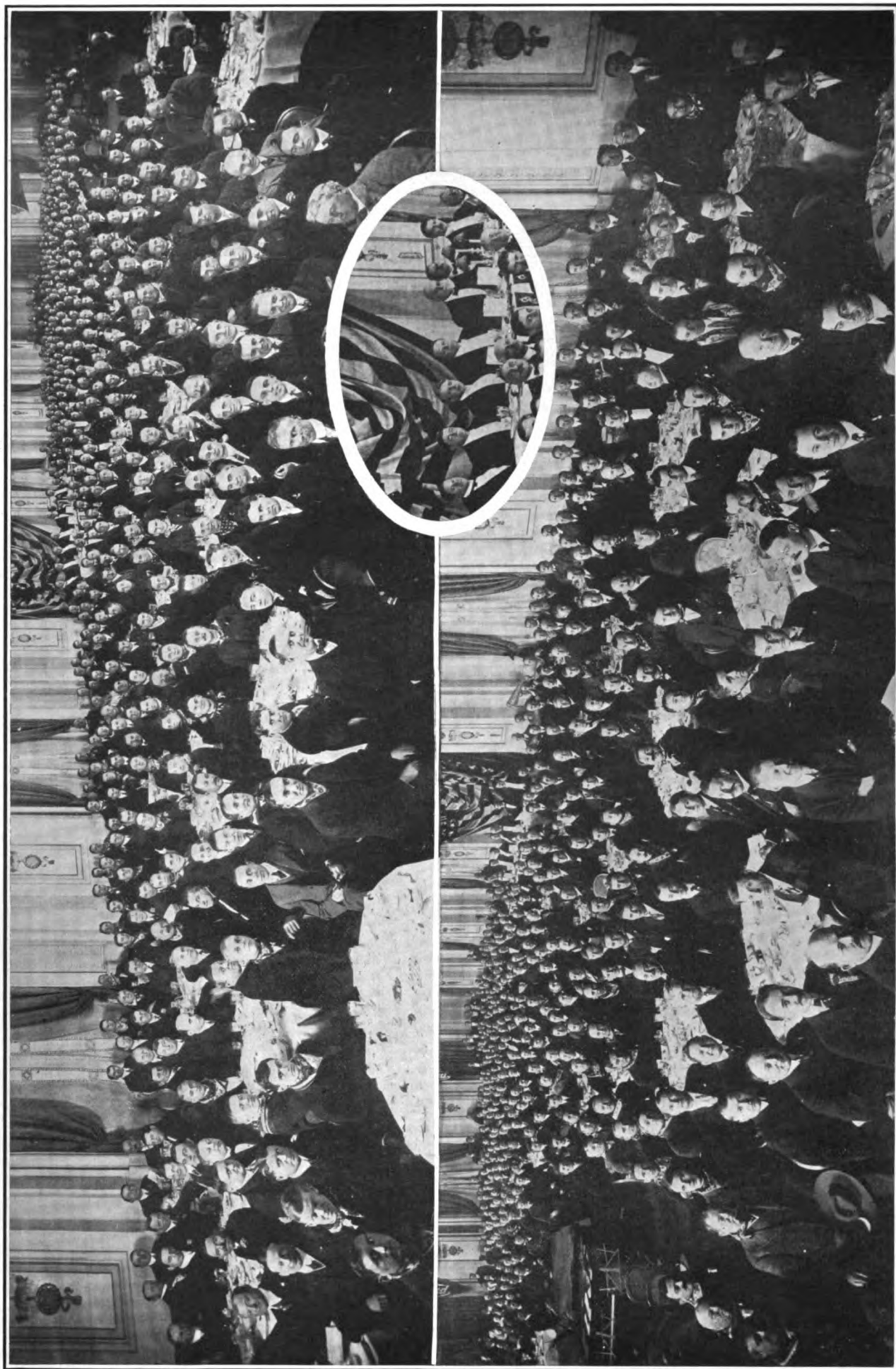
Transformed Showroom Into a Garden for Show Week



James Levy, Chalmers dealer in Chicago, transformed his salesroom into a Chinese garden for the week of the Chicago show. The decorations were simple, as the illustration shows, yet the whole display was effective and quite out of the

ordinary. Owing to the great crowd in the Coliseum and Armory many of the dealers found it a wise plan to have prospects visit their salesrooms, many of which were similarly decorated. The scheme proved to be a really good one.

Overland Dealers Gathered at the La Salle for the Company's Annual Dinner



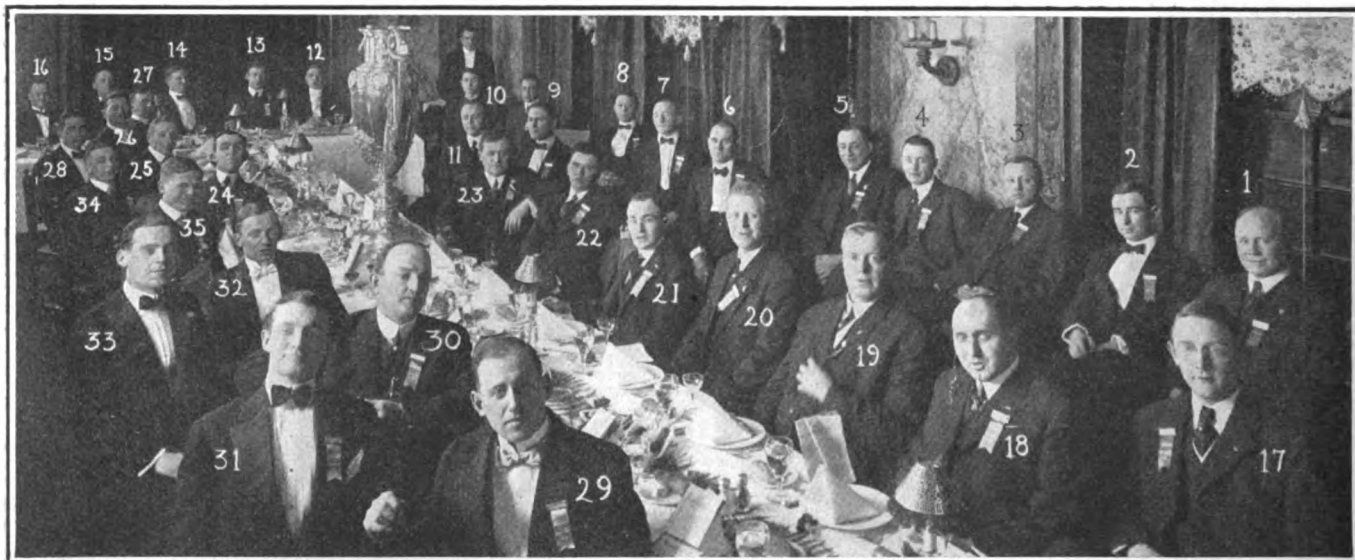
Those at the speakers' table, shown in the insert, are, left to right: Charles W. Price, Chicago dealer; Charles Y. Knight; John N. Willys; Toastmaster C. S. Jamieson; Isaac D. Kinsey, vice-president of the Willys-Overland Co.; Alfred Reeves, National Automobile Chamber of Commerce; Harry Harper, sales manager, Willys-Overland Co.

The Reo Men Assembled and Dined at the Annex



At the Reo dinner, those at the speakers' table, left to right, are: (1) L. H. Fawkes, Minneapolis distributor; (2) H. W. Kardell, St. Louis distributor; (3) A. C. Heath, Fort Dodge, Ia., distributor; (4) W. W. Sears, Des Moines, Ia., distributor; (5) Robert C. Rueschaw, sales manager, factory; (6) Edward W. Westlake, Chicago Post, toastmaster; (7) E. LeRoy Pelletier, advertising counsel; (8) O. C. Owen, Chicago, distributor; (9) A. H. Jones, Hastings, Neb., distributor; (10) H. J. Adams, Fostoria, O., distributor; (11) A. J. March, Milwaukee, distributor

Thermoid Western Men Who Dined Together



(1) J. I. Tierney, Knight Motors Co., Fort Dodge, Ia.; (2) Robert Burman; (3) J. W. Barnheisel, Motor & Machinists Supply Co., Kansas City, Mo.; (4) E. R. Schultz, Schultz Automobile Supply Co., Sioux City, Ia.; (5) John Elgin, Radec Motor Tire Co., Cedar Rapids, Ia.; (6) D. O. Pohlman, general sales manager, Chicago, Ill.; (7) Lee Freudenthal, Chicago; (8) George Ballou, Osgood Co., Chicago; (9) O. C. Hendry, Chicago; (10) A. Nesta, Tenk Hardware Co., Quincy, Ill.; (11) F. T. Ware, G. Sommers & Co., St. Paul, Minn.; (12) Harry Portugal, Eastern office; (13) Frank Horn, Philip Gross Hdw. Co., Milwaukee, Wis.; (14) J. E. Duffield, district manager, Chicago; (15) A. J. Barth, Radec Motor Tire Co., Cedar Rapids, Ia.; (16) L. J. Miley, Chicago office; (17) B. O. M. Bonebrake, Des Moines Auto Supply Co., Des Moines, Ia.; (18) Theo. Bass, National Electric & Auto Supply Co., Peoria, Ill.; (19) F. S. Smith, Smith Automobile Co., Sioux Falls, S. Dak.; (20) J. B. Schroeder, Indianapolis office; (21) Paul Frank, Chicago Daily News; (22) C. T. Hutswit, United Motor Truck Co., Grand Rapids, Mich.; (23) J. W. Pohlman, Indianapolis; (24) J. E. Farity, Knight Motors Co., Fort Dodge, Ia.; (25) A. C. Muehler, Philip Gross Hardware Co., Milwaukee, Wis.; (26) J. L. Malone, Mackemer & Pinkerton, Peoria, Ill.; (27) F. L. Huber, St. Louis office; (28) P. B. Franklin, Chicago; (29) P. Q. Ray, Whitaker Mfg. Co., Chicago, Ill.; (30) W. E. McKechnie, Cadillac Motor Car Co., Detroit; (31) J. L. Ward, Chicago; (32) E. M. Elliott, United Motor Truck Co., Grand Rapids; (33) J. H. Liston, Detroit; (34) J. L. Malone, Mackemer & Pinkerton, Peoria, Ill.; (35) R. Blickenderfer, Chicago

WESTERN DEALERS DISCUSS CENTRAL MARKET REPORT

Dealers representing the principal cities of the Middle West listened to an explanation of the Central Used Car Market Report at a luncheon given Thursday of show week at the Chicago Athletic Club by the Chicago Automobile Trade Association; they were pres-

ent as a part of the association's plan to make its report national in scope.

The situation was summarized by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, in a comparison of the market report with an umbrella which the Chicago association is endeavoring to extend over the trade of the whole country. He said the condition of the dealer

in many instances is absolutely criminal and he went unqualifiedly on record as in favor of selling the buyer the new car and then entering into negotiations as to the allowance on the old car.

Ten trade associations are subscribers, and the present issue is 140 greater in circulation than the one preceding. Among other cities, St. Louis agreed to cooperate.

Franklin Men Dined in Full Force at the Annex



(1) J. T. Peacha, Duluth, Minn.; (2) L. A. Henschneider, Duluth, Minn.; (3) S. G. Johnson, Des Moines, Ia.; (4) S. L. Carpenter, Amboy, Ill.; (5) Andrew Aschenbrenner, Amboy; (6) D. H. Duncan, Moline, Ill.; (7) J. F. Stroebe, Neenah, Wis.; (8) Arthur Barth, Billings, Mont.; (9) C. H. Sanger, Milwaukee, Wis.; (10) F. A. Babel, Kankakee, Ill.; (11) W. M. Phillips, Lexington, Ky.; (12) E. F. Williams, Kansas City, Mo.; (13) J. B. Dwyer, Jr., St. Louis, Mo.; (14) L. A. McKay, Minneapolis, Minn.; (15) Clayton S. Carris, Chicago district manager; (16) Knapp Brown, Sioux Falls, S. D.; (17) Alfred James, Eau Claire, Wis.; (18) M. B. Richardson, district manager, Atlanta, Ga.; (19) W. E. Johnson, Remington, Ill.; (20) C. J. James, Jr., Eau Claire, Wis.; (21) E. H. Cooper, Stewart, Ia.; (22) W. E. Butler, Chicago, Ill.; (23) O. C. Belt, Columbus, O.; (24) C. H. Rockwell, district manager, Cleveland, O.; (25) Fred Witters, Saginaw, Mich.; (26) F. B. Heathman, Dayton, O.; (27) J. R. Jackson, Grand Rapids, Mich.; (28) E. L. Baker, factory; (29) E. R. Nelson, Ishpeming, Mich.; (30) S. G. Crane, factory; (31) S. E. Ackerman, factory; (32) E. T. Byram, Galesburg, Ill.; (33) L. J. Theiss, Rockford, Ill.; (34) W. J. Doughty, Detroit, Mich.; (35) S. K. Hatfield, Peoria, Ill.; (36) D. W. Cook, Galesburg, Ill.; (37) C. C. Myers, Peoria, Ill.; (38) W. J. Dolan, advertising counsel; (39) Jesse Simpson, Danvers, Ill.; (40) Arthur Holmes, sales manager, Franklin Automobile Co., Syracuse, N. Y.; (41) Ralph C. Hamlin, Los Angeles, Cal.; (42) R. H. Cramer, Waterloo, Ia.; (43) William F. Sanger, Milwaukee, Wis.; (44) M. Thier, West Brooklyn, N. Y.; (45) S. H. Sanders, Chicago, Ill.; (46) Louis Ohnhaus, Terre Haute, Ind.; (47) A. J. Dewey, Chicago, Ill.; (48) Ray W. Sherman, Motor World; (49) D. A. Smith, Chicago, Ill.; (50) L. Springer.

King Men Had a Royal Time at the Metropole



(1) Artemas Ward, Jr., vice-president, King Motor Car Co.; (2) F. A. Volbrecht, secretary-treasurer, King Motor Car Co.; (3) J. G. Bayerline, president and general manager, King Motor Car Co.; (4) W. L. Daly, sales manager; (5) R. P. Bishop, assistant sales manager; (6) John Moghart, factory superintendent; (7) T. A. Bolinger, factory manager

OVERLAND DEALERS DINE IN WESTERN ATMOSPHERE

A really wild and wooly western atmosphere characterized the dealers' dinner of the Willys-Overland Co. in the La Salle Monday night after the close of the automobile show.

The top floor of the hotel outside the banquet hall was transformed into a Forty-niner city. As the guests entered the floor they found the National Bank

of Stoney Bend handing out money. One of the best indications of the country's prosperity was the ease with which one could get a bundle of money at this bank. An evidence of the prosperity of the Overland dealers was the rapidity with which they parted with this money at the numerous roulette wheels and faro layouts on the floor. These were run by sundry bemoustached individuals who looked desperate.

Each man was given a bandanna hand-

kerchief, a devilish-looking moustache or goatee, and some of the more robust drew sheriffs' badges. The badges were not entirely useless, for there was a disreputable-looking jail in a corner where even the elect of the corporation were not immune from incarceration.

The principal speaker was, of course, John N. Willys himself; he told of the past history of the company and of some of its future plans, depicting on a chart the growth of the plant in Toledo.

WIDE-AWAKE MERCHANDISING

STICK-TO-ITIVENESS WILL WIN AS THIS MAN FOUND OUT

He Had a Hunch a Man Might Buy and
He Acted on It Right Away--Also
He STUCK—Result: One More Sale

THE salesman had just driven his prospective customer home. On the way to the salesroom he had an idea. He was passing the factory of the Safe and Foundry Co. when it came to him. He slowed down, put in the reverse and backed up to the door of the office building. Then he got out and went in, climbing the stairs that led to the second story. Here the offices of the company were situated.

The idea that came to him was that perhaps he could sell a car to Mr. Jensen, the head of the Safe and Foundry Co. And when this salesman got an idea he acted on it right away. He knew Jensen slightly—had met him once or twice at the meetings of the local Board of Trade.

Glad to See Salesman

The curly-headed youth at the little gate took in his card and shortly afterward announced that Mr. Jensen would see him. He went in and found Jensen at his desk. It was about four o'clock, but Jensen did not turn on the light. He swung on his chair, extended his hand and told the salesman he was glad to see him.

"Do you intend to buy a new car, Mr. Jensen?" inquired the salesman, going right to the point.

"No, I don't!" was the answer.

"Well, Mr. Jensen, I was afraid you felt that way. But I was noticing how your old car looked the other day and I just thought I would drop in and see you."

"She does look rather shabby, but I guess she'll have to do. I've made up my mind that I won't buy a new one

this year, anyway. I'm getting along in years and I'm not so particular as I used to be a number of years ago," retorted Jensen.

"Do you mind if I tell you something about the new model we are now pushing? I am not going to ask you to buy, but I would like to have you know about it so that you will be posted."

"Not at all. The factory is closed down

for a few weeks and I am not very busy. Go ahead."

And the salesman went ahead. He started with the engine and explained a number of refinements that insured longer life and greater economy. He explained some discoveries made by the factory engineers during the past year that had resulted in certain modifications, and showed in detail how the experience of one driver, whom Mr. Jensen knew, had already indicated marked savings in tire and gasoline and upkeep cost.

Terse Story Well Told

He explained how the factory had watched their overhead more carefully during the past year than during any period of their history. He showed how extraordinary savings had been made in the purchase of certain materials and how the manufacturing cost had been

MAKES CLEVER ARRANGEMENT OF TIRE GOODS IN WINDOW



This window was designed by K. J. Hines of the Firestone branch in Washington, D. C. It is plain, inexpensive but good. The word "Firestone" on the floor of the window is made of boxes of 1-ounce tire tape; the big stone—a real stone—with "Firestone" painted on it, rests just back of a fire made of thin red cloth, burnt sticks and an electric light. Trailing vines and autumn leaves are worked in. The structure of the built-up piles of merchandise is apparent and is easily duplicated

greatly lowered on others by reason of certain innovations that Mr. Jensen could appreciate. And he talked that car more enthusiastically than ever.

Somehow or other he felt that though Jensen had turned him down right at the start there was still a chance. And after going through the manufacturing end he mentioned several improvements that meant greatly increased comfort. Then he brought out a photograph and showed it to Mr. Jensen. Jensen did not look at it.

He turned to his desk and hammered gently on it with his gold-rimmed glasses. The salesman had finished. He said nothing. He just waited. Jensen was thinking the matter over.

Suddenly Jensen's chair swung round. He looked at the salesman as if waiting. The salesman said nothing. He wasn't going to ask Jensen to buy. He had said he wouldn't. He got up and put out his hand to say good-bye. Then Jensen acted. "I want one of those cars. You can deliver it to me May first. I can't afford to take it till then because of other investments I've made. But you can enter my order for May first."

Won by Sticking to His Guns

What was the turning point of the sale? The salesman did not know for certain. He felt that the enthusiastic description of his car had helped. And he thought that the fact that he had not asked Jensen to buy even when he had felt tempted to do so had helped. In the main he knew that if he had accepted the turn-down and departed he never would have made the sale. So he scored up one point for his quality of stick-to-itiveness.

GET TOGETHER, MEN, AND TALK IT OVER

"All information sent you from the Chalmers factory should be the subject of a conference between the dealer and his salesmen," said Sales Manager Percy Owen. "Chalmers dealers receive a great many circular letters from the factory. Now these circular letters are just as important as though they were personally written. It is necessary to use them oftentimes to get information to the dealers quickly. And the information they contain is something that should go to every member of your organization.

"When I was in the retail end of the motor car business, I learned that the best way to get the most value out of every selling point developed was to hold a meeting of the entire organization."

DON'T KNOCK JUST HUSTLE

Forget About the Other Fellow and Sell Your Own Goods —Be Real Salesmen

One of the first principles of good merchandising is to sell **your own** goods. Never mind your competitor. He has his job and you have yours, and the chances are that both of you have enough to do without bothering about the other fellow. In other words, don't "knock."

It would seem as if we had arrived at a stage in salesmanship where such advice is not needed. But unfortunately such is not the case. All too many dealers and salesmen spend a goodly portion of their time telling the faults of their competitor when they should be pushing their own goods.

It is time for this to stop. It is not dignified—and it is not salesmanship. Not from any standpoint is it good business. Does it not seem ridiculous that anyone in this generation should spend money to advise the public not to purchase the other fellow's car and give the reasons why? And yet a study of the advertising of dealers in many parts of the country shows that some are doing that very thing!

If **your** car and **your** policies do not

furnish sufficient material for an interesting advertisement, save your money.

Advertising should be constructive. It should tell the facts about the car you are pushing. Don't be afraid to boost your own car! Be fearless! Be truthful! Be positive, definite and precise in your statements! Facts are incontrovertible, and if you stick to the facts about your own goods you will never have to worry about the other fellow.

OIL CONSUMPTION IN SELLING PLAN

We guarantee for \$2.50 to furnish all the lubricating oil the engine can use to run 10,000 miles.

This is part of the selling plan of the West Coast Auto Co., Tampa, Fla.; James Bros. are the proprietors. When a buyer takes his new Reo the dealers begin keeping a record of the oil buys, and if his oil bill reaches \$2.50 before the car has traveled 10,000 miles the dealers give free oil for the remaining distance.

"But," says V. A. James, "we have kept a record of several cars running in this city and figure that a Reo should use one quart to every 500 miles, or 5 gallons in 10,000 miles. We figure this to the owner at 50 cents a gallon, which nets us a good profit. We have been selling these cars for seven years and have watched their fuel and oil consumption carefully."

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. Two are illustrated herewith and these will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



These two display stands are supplied by the Stewart-Warner Speedometer Corp., Chicago, to jobbers and dealers who will provide a place for them. The stands are made in mahogany finish with a pocket at the end for a supply of literature and a space at the back for a reserve supply. The front is glass covered and may be used for an announcement of the merchandise on display.

Dealer's Legal Status

**The Only Way the Dealer, the Repairman or the Garageman
Can Protect Himself Against Disputed Bills Is by
Getting a Signed Order for Work to be Done**

By George F. Kaiser

When a motor car is brought to a garage or a repair-shop for an overhauling, or for repairs, in most instances no written contract is drawn up. The party owning the car nevertheless expects to pay for the work done, and the dealer naturally expects to be compensated for the labor and material put in on the job.

In a case like this, the law, in the absence of an express promise to pay on the part of the car owner, implies a promise on his part to pay whatever the work may be reasonably worth. The reasonable worth of the work is estimated by weighing the evidence of the witnesses produced by the car owner and the dealer at the trial of the action and is ascertained by trying to find out what charge is customarily made for similar work in the same locality.

Car Warranted to Be "Good"

In Michigan a case came up recently which was a little different from this. In 1911 a young man purchased a motor car from a garage company. The latter warranted that it was a "good car and would run all right." Shortly afterward trouble was experienced with the motor, and several times the car was returned to the garage to have the difficulty corrected.

As it still worked badly complaint was made to the garage company and the latter requested the purchaser to return the car to the garage once more for adjustment and promised that if it was not all right then he would be given a new car or his money would be refunded.

Written Orders Save Dollars

The car was again sent back to the garage and while it was there a fire occurred and the car was damaged. The garage company notified the owner of the damage to his car and he called at their place of business, and while there it was suggested to him that it would not be expensive to send it to the factory at Detroit to be repaired. The owner stated that he would not pay for any repairs on

the car; that he had bought a good car and had not yet received what he paid for.

The garage company sent this certain car to the factory with several others which had been damaged in the fire, and when it was received back it notified the owner that the car was in working order and that he should come and get it.

Garage Fire Damages Car

When the owner called for the car he was advised that there was a repair bill of \$203.85 against him. He refused to pay this and brought suit in replevin and recovered possession of the car.

The garage company appealed the case but the court held that the judgment for the owner was proper, as, after the fire, it was optional with him whether or not he wished to have his car repaired and, the garage company having caused the car to be repaired at the factory in Detroit without any agreement on the part of the owner to pay, could not recover for it.

Under circumstances like those in this case, the law would not raise any implied promise on the part of a car owner to pay for repairs; not having ordered them, he was not required to pay for them, and the fact that he had specifically stated that he would not pay for any repairs directly after the fire, made his case so much the stronger.

The dealer therefore had the trouble and expense of a law suit, was required to pay the bill for repairs at the factory out of his own pocket, and besides, undoubtedly had a "knocker," who was in a position to do him considerable harm, so far as his business was concerned, because of the court's decision.

Refused to Pay, Got Car Back

This is another illustration of how important it is for the dealer to be entirely familiar with all his legal rights and liabilities and how in a great many cases it may actually result in a cash saving.

The matter of the law implying a promise to pay for work done when there

is no written order or contract is well and good in the ordinary case. It must be remembered, however, that it is never the ordinary case that gets into court.

IF, WHEN THE DEALER HAD SENT THE CAR TO THE FACTORY FOR REPAIRS, HE HAD PROCURED A WRITTEN ORDER FROM THE OWNER, THE LATTER WOULD HAVE HAD NO CAUSE FOR COMPLAINT WHEN HE WAS PRESENTED WITH A REPAIR BILL, AND THE DEALER WOULD NOT HAVE BEEN OUT OF POCKET SEVERAL HUNDRED DOLLARS.

This Applies to You

In this department, under date of July 15, 1914, it was said, with regard to written orders: "The value of a written order will be realized by a dealer at some time when he has occasion to sue a man on a bill, and the man, much to his surprise, goes on the witness stand and testifies that the work was never ordered by him."

Last week attention was called to part of the same article, which dealt with a minor's right to disclaim responsibility for goods bought after he arrived at age, and a case was given in which a garage man lost out.

The value of reading closely the matters appearing on this page becomes apparent when we realize that if the dealer in either of these two cases had heeded the article of July 15, they would have undoubtedly acted differently.

FAIR COMPETITION DEFINED BY COURT

Goods Much Alike But Sold in Different Packages Held to Be Legitimate

In a recent Iowa case a spark plug manufacturer attempted to procure an injunction restraining another spark plug manufacturer from selling its spark plugs and from using its corporate name on the ground that they resembled the former company's to such an extent as to be a species of "unfair competition."

The trial court and the Appellate court, however, held that as the plugs made by the competitors were put on the market in different kinds of packages, it was not likely that one would be mistaken for the other, and the trade names were not similar enough to injure the petitioning party. (*Motor Accessories Mfg. Co. vs. Marshaltown Motor Mfg Co.*, 149 N. W. (Iowa) 184.)

PISTON DISPLACEMENT		CUBIC INCHES		CYLINDER MOTORS		BY CHESTER S. RICKER, ME.											
JANUARY 1915		STROKE INCHES															
BORE INCHES	3 1/2	3 3/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	5 1/2	5 3/4	6	6 1/4	6 1/2
2 1/2	137.5	142.2	147.2	152.2	157.0	162.0	176.4	181.5	195.0	201.0	211.0	224.4	230.8	235.6	240.4	245.4	250.2
2 3/8	144.4	149.5	154.6	159.8	165.0	170.0	185.6	190.5	206.2	211.2	226.8	237.2	242.2	247.4	252.4	258.0	268.0
2 1/2	151.4	156.8	162.2	167.6	173.0	178.2	184.0	194.8	216.4	221.8	238.0	248.6	254.2	259.8	265.0	270.4	281.2
2 3/4	158.5	164.4	170.0	175.8	181.2	187.1	192.8	204.4	226.8	232.4	249.6	255.4	261.0	266.4	272.0	283.6	294.6
2 3/4	166.2	172.1	178.0	184.0	190.0	195.8	202.0	210.0	237.6	243.2	255.2	261.2	267.0	273.2	284.6	297.0	308.4
2 1/2	174.0	180.0	186.4	192.4	198.8	205.0	211.2	219.6	248.4	254.2	267.0	273.2	279.5	292.0	304.8	316.4	323.0
2 3/8	181.8	188.0	194.6	201.2	207.8	214.2	220.8	227.2	259.0	266.0	279.4	285.4	292.0	305.0	318.2	331.4	337.6
2 1/2	189.5	196.2	203.0	209.8	216.5	223.6	230.2	237.0	270.8	278.0	291.4	298.0	305.0	311.6	325.4	348.6	352.4
3	198.0	203.0	212.0	219.2	226.2	233.2	240.4	247.4	282.3	289.8	304.0	311.0	318.0	325.2	339.2	353.4	367.6
3 1/8	206.2	213.6	221.0	228.4	235.6	243.0	250.4	257.8	294.6	302.0	309.4	316.8	324.0	331.4	346.4	368.2	383.0
3 1/4	214.8	222.4	230.0	237.8	245.4	253.0	260.8	268.4	306.8	314.4	322.2	329.8	337.4	345.2	368.2	383.4	394.8
3 3/8	223.4	231.4	239.4	247.4	255.4	263.2	271.2	279.2	319.2	327.0	335.0	343.0	351.0	359.0	383.0	399.0	414.8
3 1/4	232.2	240.6	248.8	257.0	265.4	273.6	282.0	290.2	331.8	340.0	348.4	356.4	365.0	373.2	398.8	414.6	431.2
3 3/8	241.2	250.0	258.6	267.2	275.8	284.4	293.0	301.6	344.8	353.4	362.0	370.8	379.2	387.8	413.6	439.6	448.2
3 3/4	250.6	259.4	268.4	277.4	286.2	295.2	304.2	313.0	357.8	366.4	375.8	384.8	393.6	402.6	429.4	456.2	465.2
3 1/2	260.0	269.4	278.6	288.0	297.2	306.6	315.8	325.0	371.6	380.8	390.2	399.4	408.6	418.0	445.8	473.6	483.0
3 3/8	269.4	279.0	288.6	298.2	307.8	317.4	327.0	336.6	384.8	394.4	404.0	413.6	423.2	433.0	461.8	490.6	500.2
3 1/4	279.0	289.0	299.0	309.0	319.0	328.8	338.8	348.8	398.6	408.6	418.6	428.6	438.6	448.6	478.4	508.4	518.4
3 3/8	289.0	299.4	309.6	320.0	330.2	340.6	351.0	361.2	412.8	423.2	433.4	443.8	454.2	464.4	495.4	526.4	536.6
3 1/2	299.0	309.6	320.4	331.0	341.8	352.2	363.0	373.8	427.2	437.8	448.3	459.2	469.8	480.6	512.6	544.6	555.4
3 3/4	309.2	320.2	331.2	342.4	353.4	364.4	375.4	386.6	430.8	441.8	452.8	463.8	474.8	485.8	519.0	552.2	574.2
3 1/4	319.6	332.0	344.6	357.4	370.2	383.0	395.8	408.6	448.6	460.0	479.4	490.8	502.4	513.8	548.0	582.2	593.6
3 3/8	330.2	342.0	354.8	367.6	380.4	393.2	406.0	418.8	469.8	481.6	495.2	507.0	518.8	530.6	566.0	601.4	613.2
3 1/2	341.0	353.0	365.2	377.4	389.6	401.8	414.0	426.2	487.0	499.2	511.4	523.6	535.8	548.0	584.4	621.8	633.6
4	351.8	364.4	377.0	389.6	402.2	414.8	427.2	439.8	502.6	515.2	527.8	540.4	553.0	565.6	603.2	642.0	653.0
4 1/8	363.0	376.0	388.8	401.8	414.8	427.8	440.6	453.6	518.4	531.4	544.4	557.4	570.4	583.2	622.0	661.6	674.5
4 1/4	374.2	387.6	401.0	414.2	427.6	441.0	454.4	467.8	534.6	548.0	561.2	574.6	588.0	601.4	641.8	680.0	695.0
4 3/8	385.6	399.4	413.2	427.0	440.8	454.4	468.4	482.0	550.8	564.6	578.4	592.2	606.0	619.6	662.0	702.0	716.0
4 1/2	397.0	411.2	425.4	439.6	453.8	468.0	482.2	496.4	567.2	581.4	595.6	609.8	624.0	638.0	681.8	723.6	737.0
4 3/4	409.0	423.6	438.2	452.8	467.4	482.0	496.6	511.2	584.2	598.8	613.4	627.2	642.2	657.0	701.4	744.8	758.2
4 3/8	421.0	436.0	451.0	466.0	481.0	496.0	511.0	526.2	601.4	616.4	631.4	646.5	661.5	676.4	721.6	766.6	781.8
4 1/2	433.0	448.6	464.0	479.4	495.0	510.4	525.8	541.4	618.0	634.4	649.8	665.4	681.0	696.5	742.6	788.4	804.0
4 3/4	445.4	461.2	477.2	493.0	509.0	524.8	540.8	556.6	636.4	652.4	668.0	684.0	700.0	716.4	763.8	809.4	828.0
4 3/8	457.8	474.2	490.4	506.0	522.2	538.6	555.0	571.2	654.0	671.6	688.6	703.8	719.8	736.0	785.0	834.0	851.2
4 1/4	470.4	487.2	504.0	520.8	537.6	554.4	571.2	588.0	672.4	689.0	706.6	722.6	738.9	756.5	790.0	837.0	857.5
4 3/8	483.2	500.4	517.8	535.0	552.2	569.4	586.8	604.0	691.0	708.0	725.6	743.0	760.0	777.6	811.8	857.0	873.5
4 1/2	496.2	514.0	531.6	549.4	567.0	584.8	602.4	620.6	709.2	726.8	744.6	762.4	779.8	797.6	828.0	873.0	898.0
4 3/4	509.0	527.6	545.8	563.8	582.2	600.2	618.0	637.0	727.6	746.5	764.8	782.5	801.6	818.5	855.0	898.0	922.0
4 3/8	522.6	541.2	560.0	578.6	597.2	616.4	635.0	653.5	747.0	766.0	785.4	803.4	822.0	841.8	878.0	928.0	946.8
4 1/2	536.2	555.2	574.4	593.6	612.6	632.0	651.5	670.0	766.0	785.4	804.0	823.6	842.5	862.0	900.0	958.0	996.6
5	549.8	569.4	589.0	608.6	628.0	648.0	667.5	687.0	785.6	805.0	825.0	845.0	864.0	884.6	923.2	982.0	1020.2

Advanced Maintenance

MAKING MANIFOLDS

By George Fernwell

(Continued from last week.)

From filling the pipes we may now turn to the subject of pipe bending equipment. It is possible for a workman skilled in this particular class of work to accomplish difficult pipe bending with the crudest or simplest facilities that may be available. For instance, Fig. 1 shows simply a hole bored in a strongly

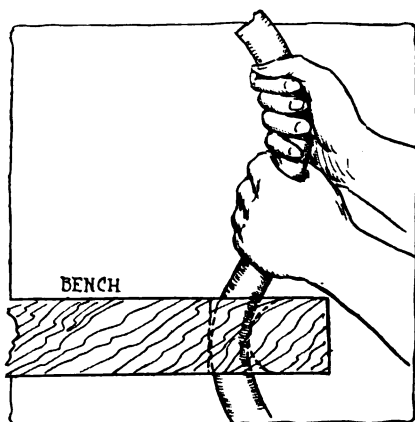


Fig. 1—In bending tubing the hands are kept close to the point where the bend is to be produced; this does not give the maximum leverage, but it confines the bend to the desired part of the pipe, leaving the balance straight

constructed work bench. With this simplest of all bending equipment, together with considerable muscular force and the experience or knowledge how to apply the force, very good work can be done.

It may be noticed upon reference to Fig. 1 that the grip of the mechanic's hands is located at a point where about the least possible leverage could be exerted; also it is obvious that considerable muscular effort would be necessary as compared with locating the grip of the hands at any point further away from the bend.

Tube Must Be Gripped Near Bend

Fig. 2 may explain the need for locating the grip of the hands close up to the bend. The illustration shows the undesirable effect produced by grasping the pipe where greater leverage may be obtained. As may be seen readily, the pipe is bent at the portion it is desired to keep straight, but also, as may not

Theory vs. Practice

Theory is not of great value in the repairshop. Rule of thumb work is dangerous not only to the work but to the bank balance.

Nothing but really practical instructions will ever get the repairshop man anywhere. Unless he can put to use instructions which are given him, they are to all intents and purposes worthless.

This Advanced Maintenance Department is giving you each week the kind of practical instructions which can be put to use and which will give **AC-CURATE RESULTS**.

These instructions and drawings are born of actual experience. They come from successful results **THAT AL-READY HAVE BEEN OBTAINED**.

We are giving you here nothing that has not been done in practice. You can make use of these instructions.

THEY WILL BRING RESULTS

be quite so obvious, the increased leverage is not effectively or fully applied to the actual portion of the pipe it is desired to bend.

As a result of such bending of the pipe where it is intended that it should be left straight, the workman will have to reverse the operation and remove the

bend. Not only does this entail additional labor and expense, but it is more than likely that the appearance of the pipe will be unnecessarily marred during the straightening process. Further, the bend is not as readily controlled when the hands are at a distance from it.

A device for obtaining and fully and effectively applying increased leverage so as to make the work of bending less dependent upon strong muscles trained to the work, will be described in due course.

To bend tubing, without heating it, to curves of comparatively small radius requires both considerable force and unyielding resistance at a certain point to the force applied, therefore the following cannot be too fully emphasized:

Bending Block Must Be Rigid

1. Whatever device may be used, such as the bench in Fig. 1, should remain absolutely rigid in resisting the force applied in bending the pipe.

2. The force, however it may be applied, should be utilized solely in the work of bending the pipe at the desired portion, and not minimized or wasted in bending the pipe at some undesired

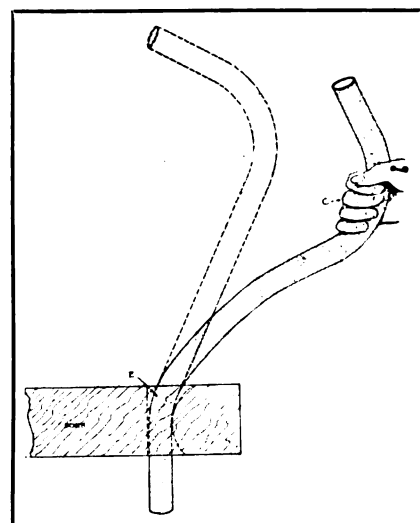


Fig. 2—If the pipe is grasped at a point where there will be sufficient leverage to make the bending easy, the curve will extend to the part that should be kept straight and extra work will have to be done in correcting it

portion or in "following up" bench, bending block, or part of a bending machine, as the case may be, which yields.

A simple form of bending block is regularly made and sold for the purpose of bending soft iron tubing without filling, such as the Loricated tube or conduit used by electricians for insulated wire. This is an inexpensive and serviceable tool for use in a repair-shop and can be had from most electricians' supply houses. With this bending device the inexperienced can better observe the results of his work as it proceeds than in the case of the use of the simple hole in the bench.

Fig. 4 illustrates a pipe bending equipment such as was used probably for generations in coppersmiths' shops for the pipe bending work of the trade. An example of the work accomplished with this equipment would be the work of bending a long length of rosin filled copper tubing so as to form a continuous helically bent worm several feet in length for distillery purposes.

Old-Fashioned Block Massive Affair

It is desirable that the workman should note that in this practicable equipment for real work it was rigidity that was the first thing sought after. In this connection it may be noted that the wooden block or anchorage would consist of a post imbedded several feet in the ground below the work-shop floor, or if this were not practical under given conditions the block would be securely braced or cleated to the floor beams. The massive proportions of the cast-iron bending plate or block should be also noted.

Fig. 5 illustrates the simple and effective, even if old-fashioned method, of obtaining increased leverage in applying bending force so that the latter was entirely utilized in bending the pipe at the desired portion exactly as extreme muscular effort would be applied in the

case of Fig. 1. Naturally, the requirements of the repair-shop would ordinarily hardly justify making and erecting such a device as that in Fig. 4. Its de-

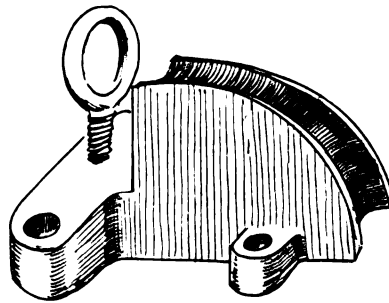


Fig. 3—This bench bending block is sold by most electrical supply houses and is convenient for pipe work, especially in inexperienced hands

scription, however, may serve two purposes.

1. To more fully emphasize the need recognized by old-time workmen for a

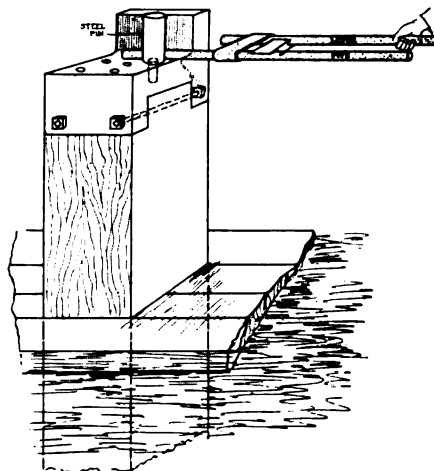


Fig. 4—Old-fashioned coppersmith's bending block; the wood anchorage is firmly set and is capped by a massive iron block on which the work is done

rigid, unyielding device on which to accomplish properly the work of bending pipe.

2. To suggest to the workman a

method of effectively applying leverage.

There are at least two distinct methods of performing the actual work of bending pipe to a given radius in using any one of the three devices illustrated. Assuming that it is required to bend the filled pipe to the radius of 4 inches, a circular or semi-circular template should be made of sheet metal of the required radius. One of the methods would be, more especially in the case of the hole in the bench, to make a succession of short bends, continually applying the template as the bending proceeds, avoiding carefully bending the pipe too much at any one point. This method, while not resulting in as clean work, serves for producing bends of any desired radius without the labor, expense and delay of making special bending pins or blocks of diameters conforming to any required radius or bend, as would be the case in the alternative method.

Making a Pipe Bending Apparatus

This latter method, as may be inferred, requires that the cylindrical surface against which the pipe would be pressed in bending be of a radius nearly equal to that of the required bend, so that in bending the pipe to a radius of 4 inches the radius of the surface around which the pipe should be bent would be approximately $3\frac{1}{2}$ inches in order that the actual bend might be accomplished without the succession of short bends indicated above, but instead with one continuous curve produced with a single or as few as possible separate bending efforts.

We may proceed to the description of a simply and cheaply made pipe bending device, constructed for actual service, which was made and used with efficiency for a considerable period before its use encouraged the construction of something more complete and elaborate for permanent use.

(To be continued.)

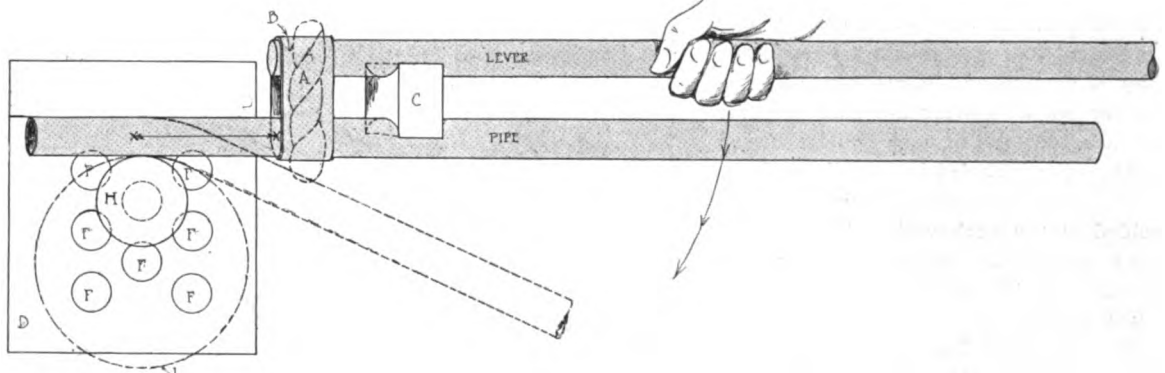
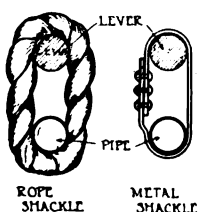


Fig. 5—This shows a method of applying leverage in such a way as to obtain exactly the same results as by hand bending as shown in Fig. 1, but with much less exertion. By the proper placing of the saddle block C and the shackle B of rope or metal, the curve can be confined within close limits and all the requisite leverage obtained

RECENT DEVELOPMENTS in ACCESSORIES

Double Purpose Tool for Fords

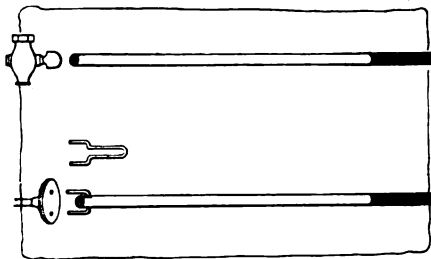
A new Nyco tool that has been developed by the New York Coil Co., Inc., New York, combines the functions of a wrench for opening and closing the pet-cocks on the bottom of the magneto housing, which ordinarily are somewhat awkward to get at, and a forked tool for use in grinding in the valves, which, instead of being slotted on the top for a screwdriver, have two holes for a double-pronged bit.

The tool is made of a piece of straight steel tubing. One end is checkered to afford a firm grip when the tool is used for valve grinding and the other end is notched or slotted. The slot fits the pet-cock handles and takes a small steel fork for grinding service. Price, 50 cents.

The advantage of the tool is that it permits the turning of the pet-cocks without messing up the hands or sleeves and at the same time provides a valve grinding tool that occupies little space.

Shims for the Stock Room

The McCord Mfg. Co., Detroit, produces shims to order in quantities for motor car builders and motor manufac-



A simple Nyco tool which opens petcocks and grinds valves on Ford cars

turers. Stock shims are made of brass in strips 51 inches long and $2\frac{1}{2}$ inches wide and put up in heavy paper cartons with metal bindings; each carton contains four strips of assorted thicknesses—2, 6, 10 and 15 thousandths. The strips sell to the jobber for 50 cents each.

extra. These are intended primarily for battery boxes and will hold eight dry cells or a small storage battery. The smallest box regularly supplied with a lock is 11 x 9; price \$3. Other sizes are 14 x 8, \$3.25; 14 x 11 and 17 x 9, each \$3.50; 20 x 8, \$3.75; 22 x 9 and 24 x 10, each \$4.50; long, narrow boxes with two locks, 28 x 10, \$7, and 32 x 10, \$8; tank box, holds Style B gas tank, batteries and tools and has lock and two catches and window in end for looking at tank gauge, 22 x 9 at the top and 22 x 10 at the bottom due to the swell for the tank housing, \$9. Wood linings cost from \$1 to \$2 extra and aluminum mats from \$1.50 to \$4. Other Mitchell products include gasoline tanks, acetylene tank covers, mufflers, fans, hose clamps, fender protectors and many other sheet metal articles.

Four special Ford boxes have been added to the list, all being 7 inches high to give door clearance. All have Yale locks. The dimensions and prices are: 14 x 8, \$3.25; 17 x 9, \$3.50; 20 x 8, \$3.75, and 22 x 9, \$4.50. Made of lighter stock and with a cheaper lock than the Yale, these boxes list at \$3, \$3.25, \$3.50 and \$4 each.

BOXES FOR TOOLS, TANKS AND BATTERIES

All of Steel, With Wide Scope in Prices, Shapes and Sizes

All the steel boxes manufactured by G. F. Mitchell & Son, Cleveland, O., are of open hearth, full cold-rolled, pickled, reannealed and limed stock; the surfaces are smooth and this assures a good foundation for the enamel. All covers are friction fitted and have a bearing all along the top of the box. Bottoms are of anti-rust sheets of heavy gauge and are raised on $\frac{3}{8}$ -inch legs to keep them clear of wet runningboards and permit a circulation of air. Covers are on stop hinges so that they will not open more than 90 degrees and so are kept clear of the car body. Covers are cold pressed, $1\frac{1}{4}$ inch deep and fit very closely. Cover depth is not included in box dimensions. Bodies are of one piece, butted and spot welded at the back with a bead at top and bottom, to add stiffness and improve appearance. The finish is two coats of baked enamel.

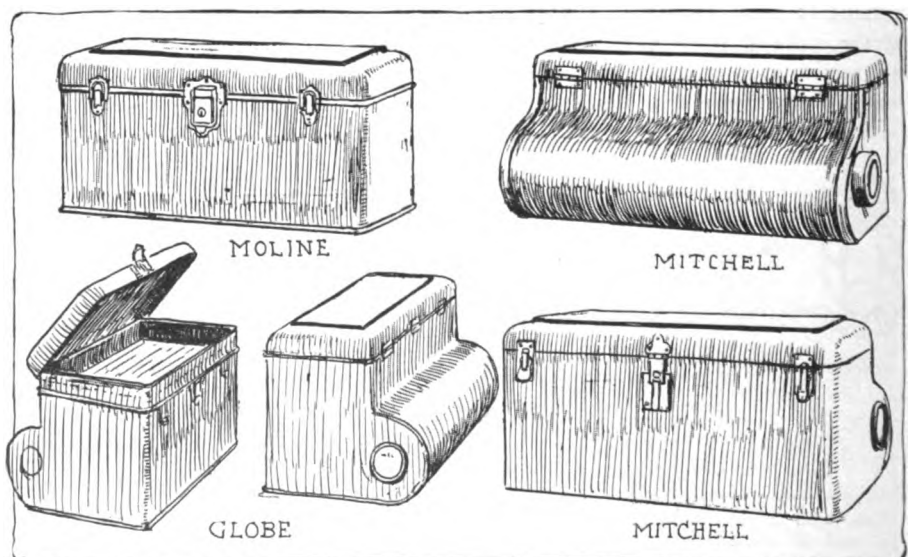
With the exception of the two smallest sizes made, Nos. 116 and 127, all boxes are fitted with Yale brass locks, either self-locking or of the toggle type; locks on Nos. 116 and 127 are extras. Wood

linings and aluminum mats are extras on all boxes.

All stock boxes are 9 inches high. The two small sizes, 11 x 6 and 12 x 7, list at \$2.50 and \$3; brass lift lock, 75 cents

Special Boxes for Fords

Pressed steel tool boxes designed expressly for use on Ford cars are manufactured by the Moline Pressed Steel Co., East Moline, Ill. Two sizes are



The Mitchell and Globe steel tank boxes each hold a B style acetylene tank in addition to batteries and tools. The Moline box is made especially for Ford cars and comes in two sizes. The one shown is the larger; the smaller has a lock but no hasps

made—22 x 9 x 6¾ and 18 x 8 x 6¾. Both are of heavy construction and are made in the same way. The bodies are of 20 gauge and the covers 18 gauge steel; all seams are electrically welded and the corners are turned under and welded to the bottom. For a finish two coats of enamel are put on, baked and highly polished. The larger size has a lock with two keys and two polished brass hasps, and the smaller has a lock with two keys and no hasps. The prices are \$5.15 and \$4.50, respectively, and the discount to dealers is 75 per cent; special discounts are given on large quantities. Each box is packed in a heavy corrugated carton properly sealed and ready for reshipment. A raised panel on the cover of each box adds not a little to its appearance.

Globe Boxes in Every Size

Some 35 different stock sizes and styles of steel boxes are manufactured by the Globe Machine & Stamping Co., Cleveland, O. In the list are included battery boxes, tool boxes, tank boxes, refrigerators, suit case boxes, special boxes for Fords and general utility boxes of various sizes. These goods are sold to manufacturers and jobbers and the discounts depend entirely upon the quantities involved. Two grades are made, the regular, which is the standard, and the Rival, which is of less expensive material; the workmanship and finish is exactly the same in both grades. The prices of the Rival grade are from 10 to 15 per cent lower than on the regular or standard. All boxes are finished in black enamel and have Yale locks.

Covers are of one piece pressed to shape with raised panel on top. Bottoms are electrically welded to lugs, which are integral with the bodies, and back seams are electrically welded. A box designated as Style B, which is comparatively high for its length and width, is made in 14 sizes, ranging from 10¾ x 5¾ x 9 to 28¾ x 10¾ x 10¾; prices run from \$2.75 to \$7 each; wood linings may be had at from \$1 to \$2 per box, according to size. The three larger sizes have two cover catches of

the suitcase type and all have locks. For from \$1.25 to \$3.50 per box an aluminum mat can be fixed on the cover. Style C is a longer-proportioned box and is made in 9 sizes from 9¾ x 7¾ x 12 to 26 15/16 x 10¾ x 12; prices, plain, \$3.25 to \$7; with wood linings, \$1 to \$2 extra; aluminum mats, \$1.50 to \$2.75 extra.

Ford boxes, which are quite long for their height and width, are made in 5 sizes from 15 x 7¾ x 6¾ to 23 15/16 x 9 13/16 x 6¾. Price, plain, \$2.85 to \$4.25; wood lining \$1 to \$1.50 extra; aluminum mat, \$1.75 to \$2.50 extra. Gas tank boxes are designed to hold acetylene tanks of the regular B size, the idea being to protect the tank from thieves. Springs are provided to hold the tank securely and prevent rattling, and there is a glass window in the end through which the gauge can be seen. Size, 20¾ x 6 3/16 x 6½, price, right or left hand, plain, \$4.50; with aluminum mat, \$2.25 extra.

A box that will hold a B size tank, tools and battery and yet will go on the runningboard is 22 x 13 x 10½; the tank is housed partly in a round projecting part at the back. Price, \$10; aluminum mat, \$2. A runningboard trunk box is 30½ x 14½ x 16 3/16 high and is heavily reinforced; weight, 40 pounds; large enough for two 30-inch suitcases. Price, \$10. Refrigerator boxes are made in four styles at prices from \$10 to \$25.

Standard Boxes in 26 Sizes

The product of the Standard Steel Box Co., Bridgeville, Pa., includes 26 stock sizes of boxes ranging from 12 x 8 x 6 to 24 x 10 x 12 and selling at prices from \$4.10 to \$6.85. All sizes are fitted with locks and from 22 x 9 x 6 to the largest—eight sizes—there are two catches as well. Five are special Ford sizes—18 x 8 x 6 and 18 x 8 x 6¾, both at \$4.50; 22 x 9 x 6¾, with lock only, \$4.85; the same size with two catches in addition to the lock, \$5.15; and 22 x 9 x 6 with two catches at the same price. Paneled lids are used on all boxes and catches are made in brass, nickel or gun-metal finish.

leather, any color, at \$3.50; the Lock Flap, at \$2.34 and \$3.80, and the Interlock, in which the edges when brought together automatically interlock and effectually shut out dust and water, in extra heavy black enamel duck at \$3 and fabric leather, any color, \$4.30. Prices are the same on covers for regular and plain demountable rims.

Premier top covers in rubber finish drill, \$3 to \$3.45, according to size; rubber finish duck, \$3.70 to \$4; rubber cloth, \$4.20 to \$4.70; fabric leather or domestic mohair, \$5.55 to \$6.15; imported silk mohair, \$6.15 to \$7.40; pantasote, \$7.40 to \$8.80. The Premier Ford radiator cover is of heavy duck with felt lining and has straps and metal fastenings and a roll-up curtain to adjust the exposed area of the radiator; price, \$1.75. Radiator covers are also made to take in the whole hood as well as the radiator, when the price is \$2.75. Heavy leather magneto covers, \$1.25.

Steering wheel covers, 16, 18 and 20 inch, mohair, 86 cents; pantasote, \$1, and leather, \$1.50. Dust covers to protect the entire car are made of gingham at from \$3.60 to \$11; enameled muslin, \$5 to \$17.20; rubber finish drill, \$7.50 to \$26, and rubber cloth at \$10 to \$37. The sizes are from 100 x 144 to 216 x 250 inches.

Atlas

Covers for tires, seat cushions, tops, inner tubes, radiators, curtains, magnetos, universals, knuckles, steering wheels, spark plugs, lamps, trunks and everything for which covers are needed on a car, are made by the Atlas Specialty Mfg. Co., Chicago. Easy Lock tire covers, which have snap buttons and are made of black enamel duck, range in price from \$2.25 to \$3.15 each; Howard covers, with patent buttons and a light spring insertion, \$2.05 to \$2.90 in black duck and \$1.70 to \$2.40 in black drill; Snug Fit, which has a flat spring along the buttoned edge, \$1.90 to \$2.75 in black duck and \$1.60 to \$2.25 in black drill; Chicago cover, with glove fasteners, \$1.75 to \$2.50 in black duck and \$1.40 to \$2 in black drill. All these covers are made for all tire sizes, plain or demountable rims.

Top covers are made in all sizes from 46 to 72 inches, of mohair, rubber cloth, mackintosh, drill, duck and enameled cloth, at prices ranging from \$3 to \$8.50. Ford seat covers are made of heavy waterproof cloth of an olive drab color. Price, for runabout, including top cover, \$12; for touring car, \$19.75. Top cover only, either model, \$4.25. Ford side curtain case, 90 cents.

COVERS FOR ALL PARTS OF THE CAR

Protection for Everything from a Spark Plug to the Whole Body

Premier

Covers for practically everything on the motor car as well as for the car itself are manufactured by the Premier Auto Novelty Mfg. Co., Inc., New York. The tire covers made are the Spring-on,

in which the top buttons are secured by being set through a steel spring half an inch wide; price, \$1.50 in black enameled drill; the Madewell, which is of unusually simple construction and is made in black enameled duck at \$1.80 and fabric

Ford radiator covers, artificial leather with Kersey lining, \$2.50; enameled cloth with blanket lining, \$2. Magneto covers are made with tight-fitting rubber disks through which the high-tension wires pass and are made for any make or model of magneto. Price, in heavy leather, \$1.60; in patent leather finish duck, 70 cents. Lamp covers are made to fit lamps of any size or shape; prices, 50 to 85 cents each. The material used is melodian rubber cloth and rubber finished cloth.

Hopewell

A complete line of tire covers, in addition to radiator and hood covers, is produced by Hopewell Bros., Watertown, Mass. The H-B spiral spring tire cover, which is held in position on the tire by an endless spiral spring, is made in all sizes and in general and removable types. The prices are \$3 and \$3.50 respectively for all sizes up to and including 38-inch; for larger sizes the price is 50 cents extra. Dealers, 28- and 30-inch, 95 cents; 31 and 32, \$1.05; 33 and 34, \$1.15; 35 and 36, \$1.20; 37 and 38, \$1.30; extra for larger sizes, 35 cents. The material is enamel duck. Each case is packed individually in a neat and substantial box.

At a lower price there is a button case made in drill and duck. In drill the price for sizes from 28 to 31 inches is 90 cents and from 32 to 38 inches \$1.15; larger, 50 cents extra; dealers, 28 to 32, 65 cents and 33 to 36, 75 cents; over, 15 cents extra. In duck, 28 to 31 inch, \$1; 32 to 37, \$1.25; over, 50 cents extra; dealers, 28 to 32, 75 cents and 33 to 36, 80 cents; larger, 15 cents extra.

Radiator covers for Fords are made at \$1; other four-cylinder cars, \$2; sixes, \$2.50. Dealers, Ford covers, 75 cents; other fours, \$1.50; sixes, \$1.60. Hood covers, Ford, \$2; other fours, \$4; sixes, \$4.50; dealers, \$1.40, \$3.10 and \$3.50.

Tompkins

Lamp covers and nothing else are manufactured by John A. Gifford & Son, New York, the line including some 300 sizes and styles. A peculiar method of manufacture is employed; the rubber fabric is cut, sewed and cemented and is then placed on forms and cured, the result being a properly shaped and thoroughly waterproof job. A few of the prices are as follows:

For cylindrical lamps, 8-inch, \$2.40 per pair; 10-inch, \$3; 12-inch, \$3.60; pocket back searchlight covers, \$1 extra per pair. For long, narrow side lamps, \$2.50 to \$3; for bullet lamps, 8½-, 9-, 9½- and 10-inch, \$3, \$3.10, \$3.20 and \$3.30; for oil side or tail lamps with bail, \$2.40 to

\$3.45. The discount to dealers is 50 per cent.

Gordon

The line of goods produced by the J. P. Gordon Co., Columbus, O., includes covers for tires, seats, hoods, radiators and tops, all of which are made in a wide range of styles and sizes. A specialty is made of radiator and hood covers for all makes and models of cars.

The Gordon radiator robe covers both hood and radiator, with an adjustable opening over the latter so that the area exposed for cooling can be made to suit the temperature and the radiator can be wholly covered when the car is left standing.

These covers are made sectional so that the engine hood can be raised without taking the cover off entirely. The outer covering is of waterproof material and the lining is a non-conductor of heat.

The prices run from \$1.50 to \$4 for radiator covers only, and from \$3.25 to \$8 for complete hood and radiator covers. A few radiator cover prices are Buick, \$2.25 and \$3; Chalmers six, \$3; Cole, four or six, \$3; Ford, \$1.50; Franklin, Hudson four and six, Oakland four or six, \$3; Overland, \$2.25 and \$3; Peerless and Packard, \$4. Complete hood and radiator covers, Buick, \$5 and \$6; Chalmers, \$6.50 and \$7; Cole four, \$6; six, \$7; Ford, \$3.25; Franklin and Hudson six, \$7; Hudson four, \$6.50; Oakland four and six, \$6.50 and \$7; Overland, \$5 and \$6; Packard and Peerless, \$8. Special covers are made at regular prices plus \$1 for new pattern making.

Niagara

Niagara spiral spring tire covers, Fitzwell spring flap tire covers, seat slip covers, radiator and hood covers, lamp and magneto covers, and knuckle boots are manufactured by the Niagara Fabric Mfg. Co., New York. Niagara tire covers are made to fit any size or style of tire and rim, plain or non-skid tread; dealers' price, \$1.25 each, 20 per cent on orders for 100 or more. Fitzwell tire covers have a clock-steel spring in the inner flap and ball-and-socket glove fasteners; dealers' price, \$1, 20 per cent on orders for 100 or more. An extra 10 per cent is allowed on Ford sizes.

Slip covers are of heavy double texture fabric with rubber interlining so that they are waterproof and can be cleaned with soap and water. Binding is of fabric leather and arm pieces and other wearing points of patent leather. The rear of the front seat is covered with a scratch apron containing pockets corresponding with those it covers. Dealers' prices, \$6 for roadster and \$10 for

touring car styles; 20 per cent on orders of 10 sets or more.

Lamp covers are of rubber and will not peel or crack; put up in boxes of five; dealers, \$2.25 per box. Steering knuckle boots of heavy leather, dealers, 35 cents each; for Fords, 65 cents per set of three. Magneto covers, heavy patent leather, any type magneto, dealers, 90 cents.

Bondy

Four different grades of hood and radiator covers are manufactured by the Bondy Mfg. Co., Cleveland, O. The outer part is of a good grade of imitation leather and the lining of suiting cloth in all grades, the grades differing chiefly in the matter of interlining. The Bondy cover has an interlining of asbestos cloth and felt throughout and the price varies from \$7 to \$15 according to the size. The Tesmer cover has asbestos cloth interlining over the radiator and asbestos felt over the hood; price, \$6 to \$12. The Euclid cover, with asbestos felt interlining throughout, sells for from \$5 to \$9. The Imperial cover has felt interlining throughout (not asbestos felt); price, \$4.50 to \$7. Dealers get a discount of 20 per cent and jobbers 30 per cent.

Auburn

Spark plug carrying cases are manufactured to meet special requirements by the Auburn Leather Goods Co., Auburn, N. Y., at prices which vary with style, quality and quantity from 2½ cents to 55 cents each. The standard type of spark plug case has a metal frame with a metal fixture for holding the plug, and the leather covering is neatly lined. Sample cases for salesmen, store display cases, tool box cases, individual pocket cases and others are designed to carry four, six and eight plugs. Retail prices range from 50 to 100 per cent higher than dealers' prices.

Bosch Puts Up Cash Prizes

The Bosch Magneto Co., New York, has offered \$1,900 cash to be given to the Bosch equipped cars finishing in the first three places in the races to be held February 22 and 27 in connection with the Panama-Pacific Exposition—the Grand Prize and the Vanderbilt Cup. The winner of the Grand Prize will get \$500—provided he uses a Bosch magneto—and second and third men will receive \$150 and \$100 respectively. The Vanderbilt Cup winner will get \$300 and second and third drivers \$150 and \$100. In case Bosch plugs are used in addition to Bosch magnetos, \$100 will be added to the prize, whether first, second or third.

Dealer Supply House

The RETAIL NEWS



Garage Repair Shop

A concentration has been effected in the ownership of stock in the Brown-Rowan Buck Auto Sales Co., Indianapolis distributor of the Studebaker. A. W. Buck and I. V. Rowan have acquired the stock of W. J. Brown, one of the original incorporators of the company and associated with the company until seven months ago. He is now in the sales department of the Dodge Bros. factory in Detroit. Buck will be president and general manager and Rowan will act as secretary and treasurer, as they have been doing since the retirement of Brown. For the present the old name will stand.

P. A. Williams, Jr., of the Williams Motor Sales Co., has taken the Dodge Bros. agency in Springfield, Mass. The new salesroom is at Worthington and Chestnut streets and a new service station has been erected. H. D. Day, the New England representative, was there on the arrival of the first car; also Mayor John A. Denison, to whom Day presented a silver loving cup in behalf of Williams. Williams gave a luncheon to 15 of his service men and the mechanism of the car was explained to the men by a representative of Dodge Bros.' factory.

The Milwaukee Motor Sales Co. has been organized by J. C. Cox, F. S. Durham and F. E. Bassett to take over the business of the Stanley Steamer Co. and the Burgett Auto Co., Milwaukee. The agency lines consolidated by the organization are Stanley Steamer, Lewis VI and Detroit, which the concern will represent in Wisconsin and upper Michigan. F. E. Bassett, manager of the company, was for two years manager of the Milwaukee branch of the J. I. Case T. M. Co., Racine, Wis.

Chester C. Henry, who has been in the trade in New Jersey since 1898 and has been connected with the Haynes Automobile Co. for some time past, has formed a partnership with I. S. Cain, which will be called the Cain-Henry Motor Car Co. Offices, salesrooms and a service station have been opened in Morristown, N. J., and a branch service station in Summit, N. J. The Haynes and Oldsmobile will be distributed in Sussex and Morris counties.

The Racine Carriage Co., organized recently in Racine, Wis., as a consolidation of the Richardson-Kennedy Co. and the vehicle department of the Racine works of Racine-Sattley Co., has established a department for the rebuilding, repair, repainting, overhauling and trimming of motor cars in its new plant, which occupies the entire quarters of the old Racine Carriage & Wagon Co.

E. R. Fosdick, of the Fosdick Auto Co., Reo dealer in Spokane, has appointed S. E. Hunt, of Colfax, Wash., Reo dealer in Whitman county; R. B. Baines has secured the Reo agency at St. John, Ida. The Farmers Union Grain & Supply Co. was appointed Reo dealer in Latah,

Wash., and W. A. Buckley will act as Reo representative in Sprague, Wash.

J. S. Harrington, formerly dealer in the Everett in Worcester, Providence and Boston, and later located in Springfield, Mass., as manager for the E. V. Stratton Co., has joined A. L. Gifford, and organized the Harrington-Gifford Co. to handle the Hudson in Springfield. They will occupy a new building, 95-99 Liberty street, about February 1.

The Broome-Bergener-Abe Sales Association has been organized in Burlington, Wis., by George Broome, C. O. Bergener and G. Frank Abe to handle the Ford. It will also distribute a varied line of supplies in Wisconsin, Minnesota and Northern Illinois. Offices have been established in the Kruckmann building, Burlington.

Philipson Bros., owners of the largest garage in Argyle, Wis., are preparing plans for a \$25,000 two-story building in which will be a garage and repair-shop and an auditorium seating 300 to 400. It will be of brick and hollow tile construction, fireproof, 64 x 90 feet, with basement. It will be ready May 15.

The Central Garage and Repair-Shop, Pittsfield, Mass., one of the first operated in Western Massachusetts, has been purchased by John E. Wood, Hoosick Falls, N. Y. Former Mayor H. D. Sisson, president of the Sisson Motor Co., which conducted the garage, will continue as dealer in several lines of cars.

The Indian Village Garage has been opened at 1524 Jefferson avenue, Detroit, by A. H. Dorsey, until recently manager of the Detroit branch of the Anderson Electric Car Co. The garage will care for 75 electrics and a small number of gasoline cars. The floor, 75 x 200 feet, is free from posts.

J. F. Reeves, formerly of Dallas, has been appointed California representative of the Pilot car, with headquarters in San Francisco, and will establish agencies in the territory north of Bakersfield. The Wilshire Automobile Co., Los Angeles, will cover the southern portion of the state.

George M. Weatherbee and C. A. Orr, formerly of the Hollander Motor Car Co. of Boston, Cartecar dealer, have formed a company to handle the Century starter for Ford cars, with salesrooms at 29 Cambria street. Their territory includes Mains, Massachusetts and Rhode Island.

The firm of Vanden Berg & Vaughan has been organized in Grand Rapids, Mich., by Melbourne Vanden Berg and C. E. Vaughan, who were formerly associated with the Cadillac agency. They will conduct a repair business and may take the agency for a low-priced car.

The White Motor Sales Co., which is now located on West Market street, Akron, O., has leased the premises at 199 East Market street in that city. The company proposes to build the largest

garage in Akron, to have 18,000 feet of floor. W. L. Stouffer is manager.

O. R. Carman and D. M. Gamble have opened a garage at 524 Charles street, Wellsburg, W. Va. They have the agency for the King in Jefferson county, O., and Brooke and Hancock counties, W. Va., and will also handle the Overland in Brooke county.

The Morton-Gregory Auto Co. has opened salesrooms in Indianapolis at 704-6 Broadway, the quarters formerly occupied by the Goodrich-McTigue Co. The new company has secured the Maxwell distribution for part of Indiana and Tennessee.

W. N. Durbin and W. R. Thomson, Milwaukee, Wis., have formed the Durbin-Thomson Co., Ltd., to act as Wisconsin distributor of the Moon. Both have been connected with the motor car sales business in Milwaukee for several years.

The Arrow Motor Co., Indiana, Pa., has applied for a Pennsylvania charter and will conduct a garage and sales business. The incorporators are C. H. Moore, M. C. Watson, J. Paul Widdowson, R. W. Waton and R. M. Shaffer.

Swenson & Rosholt is the new style of the Swenson Bros. Garage, Iola, Wis. Halbert Swenson has sold his interest to Jacob Rosholt, who becomes the partner of C. J. Swenson. The firm will handle the Overland, Ford and Case.

F. C. Thompson, formerly assistant chief engineer of the Lozier Motor Co., has been appointed manager of the Detroit branch of the Morse Chain Co., Ithaca, N. Y.; it was recently opened in the Dime Savings Bank building.

W. N. Pearson, Salem, O., has bought the garage on East Main street formerly operated by C. W. Zimmerman. Pearson will conduct a repair and transfer business, and Zimmerman will devote his time to the Studebaker agency.

Kessler & Wagner, Overland and Studebaker dealers in Prairie du Sac, Wis., have taken possession of a new garage and repair-shop. The building is of fireproof construction, 44 x 80 feet, and of ornamental design.

The Tollack Auto Co., Black River Falls, Wis., has been dissolved, O. C. Flugstad retiring to give his attention to the Ford agency. Theodore Tollack continues the garage and repair-shop and the Overland agency.

George S. Phillips has leased the Monessen Garage, Monessen, Pa., one of the best steel towns in the Monongahela valley, and reopened the place for business January 1. It is located at Donner avenue and 9th street.

The Auto Top & Seat Cover Co. has been organized in Kalamazoo, Mich., and is located at 214 East Water street. S. G. Brink, formerly in charge of the trimming department of the Michigan Buggy Co., is manager.

E. A. Taylor and H. E. Donehoo,

McConnellsville, O., have purchased Harry S. Walker's garage in that city for \$1,500. They will enlarge the building at once and add considerable new equipment.

The Marathon Motor Car Co., Antigo, Wis., has moved from its garage on East 5th avenue to a new garage on Edison street, where the salesroom, garage and repair-shop space are more than doubled in size.

T. Wheeler, Fort Worth, Tex., who was district sales manager of the Chalmers Motor Co., is now general manager of the Bryant Machinery Co., of this city, which has taken the Chalmers agency.

W. N. Dunbar has been made Pittsburgh branch manager of the Ford Motor Car Co. He goes to Pittsburgh from Cleveland, where he was associated with the Ford company. He succeeds H. E. Weir.

The Auto Service & Supply Co., 708 3rd street, Milwaukee, has installed equipment for recharging and repairing storage batteries and installing electric equipments. It is a Vesta service station.

Plans are being prepared for a garage for W. C. Blanchard, Wilkins and Linden avenues, Squirrel Hill, Pa. The garage will be located in the center of the best residence section of the city.

Harry A. Nelson, Erie, Pa., has opened a two-story garage, 68 x 105 feet, on East 18th street in that city; it is one of the most complete establishments of its kind in Northern Pennsylvania.

H. B. and W. R. Thorp, who until recently handled the Studebaker in Kansas City, have formed the Velie-Thorp Motor Co., with headquarters at 1509 McGee street; they will handle the Velie.

The Little Giant Sales Co. has been incorporated in Pittsburgh by Frank A. Brady, Raymond Burns, William J. Roney and Mary Elizabeth Burns. It will conduct a repair business.

William Hilliard, holder of the record climb to the clouds up Mt. Washington and winner of the light car race at Savannah in a Lancia, has taken the Boston agency for the Pathfinder.

The Millikin-Loveland Motor Car Co. has been organized by B. A. Millikin and others in Youngstown, O. Salesrooms for the Chevrolet have been opened at 833 Market street.

H. F. Daniels has opened a cooperative repair-shop at 1107 East Pike street, Seattle, under the name of Lions Auto Repair Shop; Daniels and his employes cooperate and share the profits.

The Fisher Automobile Co., Mondovi, Wis., is about to occupy a new garage and repair-shop. The shop is 30 x 40 feet and equipped with a full line of power and manual tools.

I. D. McGrew, 1929 Grand avenue, Kansas City, has secured the agency for the Pullman in Kansas, parts of Missouri and Oklahoma. He formerly was a dealer in used Fords.

J. D. McIntyre, for several years superintendent of the service station of the Premier Motor Car Co., Boston, has opened a repair-shop at 29 Green street, Cambridge, Mass.

Joseph Mazer and William Fisher, Pittsburgh, are erecting a two-story garage and supply store, 67 x 110 feet, on Webster avenue between Tunnel street and 6th avenue.

E. R. Fosdick has withdrawn from the Hodgins-Fosdick Co., Spokane, Wash., and will reenter the trade as Reo dealer. The Fosdick Auto Co. is the name of the new company.

The Packard Motor Co., Pittsburgh, Pa., is being incorporated under Pennsylvania laws by J. A. Lager, R. T. Rossell and E. C. McHugh. It will handle the Packard.

The Tallyho Garage, Los Angeles, has been purchased for his sons by T. Filben. It is under the management of C. E. Sellers, who has been retained as manager by Filben.

The Spear Auto Co., one of the leading dealers in Portland, Me., has changed its name to Peterson Motor Co., following a change in the personnel of the corporation.

R. W. Vining, formerly sales manager of the Oakland branch in Boston, has taken the agency for the Paterson in that city; headquarters are at 320 Newbury street.

The newly-formed Denby Motor Truck Sales Co., organized to handle the Denby in Boston and vicinity, has secured temporary salesrooms at 68 Brookline avenue.

A. P. Sackley, who handled the Briscoe in Lowell, Mass., has taken the New England distribution of the Crow. Headquarters will be temporarily in Lowell.

George H. Robie has established headquarters at 410 Sprague avenue, Spokane, from which he will distribute the Double Mileage Portable Steam Vulcanizer.

Henry Blankfort, Grand Rapids, Mich., has purchased the Willey Garage and will style it Colonial Garage. It is located at Charles avenue and Wealthy street.

The Isotta-Fraschini Motor Co., 5th avenue and 57th street, New York city, has taken the distribution of the Scripps-Booth in the metropolitan district.

The Mammoth Auto Exchange, Inc., has been organized in Pittsburgh by L. C. Pettler, E. A. Cohen and B. Himmelrich. It will establish a garage.

H. W. Perkins, Moundsville, W. Va., has bought a lot, 70 x 110 feet, at 6th street and Lafayette avenue; he will build a garage and repair-shop.

W. H. Ortwein and J. G. Owens have opened the Yakima Avenue Auto & Wagon Works at Yakima avenue and 11th street, Tacoma, Wash.

The Thomas B. Jeffery Co. has reopened in San Francisco the branch which was discontinued a year ago; E. W. Milburn is in charge.

J. A. Burgamy, for several years a tire salesman, has established the Cash Buyers' Auto & Supply Co. at Main and Canal streets, Cincinnati.

W. R. Williamson and C. H. Starr have purchased the stock of the Barnes Motor Co., Rockford, Ill. The company is a Studebaker dealer.

J. H. Bates & Son, Woburn, Mass., has taken the agency for the Overland for Woburn and Winchester; headquarters are in Woburn.

The McGraw Tire & Rubber Co., East Palestine, O., has opened a branch in Boston at 667 Boylston street; Wallace G. Page is manager.

D. H. Smith, Kansas City, has secured permission to build a one-story brick and stone garage at 4513 Troost avenue; the cost will be \$5,000.

Mission Garage is the style under which Hubbs & Brisac have entered the trade in Santa Cruz, Cal. It is located on Pacific avenue.

The Moss Garage has been opened on Brush and Higham streets, St. Johns, Mich. It handles the Maxwell and Studebaker.

G. T. Cook and Myron J. Hall, Grand View, South Casco, Me., have formed a company and taken the agency for the Maxwell.

Salesrooms for the Flanders electric have been opened at 270 East Jefferson avenue, Detroit. A. C. Olfs is manager.

John Streeter and Loyal Newville, Boyne City, Mich., have opened a garage under the name of Pine Lake Garage.

A garage will be opened in Roscomon, Mich., by J. W. Zeahringer, Chicago, and C. E. Doose, Evanston, Ill.

The Potter & Petrie Garage, Battle Creek, Mich., has moved into new and larger quarters on West Main street.

Earl J. French, who recently secured the agency for the Overland in Escanaba, Mich., has opened salesrooms.

The Ritzville Garage, Ritzville, Wash., has taken the agency for the Chalmers. Chris Reker is the owner.

W. J. Benson, San Jose, Cal., has opened a garage on North 1st street; he has the Maxwell agency.

Floyd H. Johnson, Mt. Pleasant, Mich., has opened a garage on West Broadway. He handles the Ford.

John J. Hunt has taken the Reo agency in Lynn, Mass., with salesrooms at 38 Pleasant street.

B. A. Rhoads is building a garage in Sandy Lake, Pa.; it is on the site of the old Excelsior stables.

Edward Callahan, Omaha, will build a garage; he has secured a site near the Fontenelle Hotel.

The Woodward Garage, 2711 Woodward avenue, Detroit, has been opened by F. E. Ellis.

The Fosdick Auto Co., Spokane, has taken over the Winton Motor Car Co.'s service station.

George Kendall has established a repair-shop on North 2nd street, Stevens Point, Wis.

The Fairmount Garage, Lancaster, Pa., has added salesrooms; it has the Allen agency.

D. W. Turley, Dyersville, Ia., plans to erect a garage; the estimated cost is \$10,000.

J. T. Brown, Clare, Mich., has purchased the garage business of Alfred Bros.

Jack M. Osmond has opened a repair-shop at 1722-4 Broadway, Seattle.

The Home Garage, Paducah, Ky., has taken the agency for the King.

W. J. Bailey, Madisonville, Ky., has taken the agency for the King.

A garage has been opened in Fenton, Mich., by Charles A. Sutliff.

J. V. Ekberg, Worcester, Mass., has taken the Paige agency.

Jack Niertz, Lacrosse, Wash., has secured the Paige agency.

Torrey & Vaille, Concord, Mass., have taken the Ford agency.

Fred Miller has opened a repair-shop in Clio, Mich.



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Selling Used Cars

NINE times out of ten a prospect who has a used car to trade in part payment for a new car is a better business man than the salesman and naturally the dealer comes out at the small end of the deal. This statement has been publicly made many times of late in dealers' meetings. During the New York show three or four large distributors concurred in this verdict, and at the Chicago show last week there were dealers from six or eight cities, all of whom agreed.

Dealers can largely rid themselves of this handicap by a closer study of the used-car market, by becoming more familiar with the selling of used cars. The market reports that are now gaining wide reputation are doing their work, but they are worthless unless the salesman handling used cars makes use of them.

Figure Your Overhead

The gravest errors in handling used cars are two. First, the salesman very frequently does not know the real selling value of the old car that he is taking in part payment for the new car; and second, he does not know what profit he is making on his new car.

The used-car market reports, if followed, will very materially help him out of one difficulty; but only a good business system in the office will let the salesman know exactly what profit he makes out of the new car. Many a dealer has scarcely any conception of what it costs to take a motor car off the freight car, bring it to the salesroom, go over it and deliver it to the customer. He has failed to add his amount of overhead, he has failed to realize that although he is

allowed 20 per cent discount or higher from the maker, yet he must subtract many items from this amount; in other words, the dealer who is not a business dealer will by the end of the year find his profits largely wiped out, and his business an unprofitable one.

Discarded Parts

THERE is in one of our largest cities a big dealer, who has what he calls a second-hand parts room, to which are consigned parts from old cars which may be sold for junk. This second-hand stock room is well filled with old parts that are often sold at a good price or used later for repairs on used cars. For example, if a car has been practically wrecked in an accident several of the gears from the gearset may be removed. They are as good as new. Part of the steering gear may be in first-class condition. The hair out of the upholstery may be sold at a good price. Not infrequently from motor trucks you will have old chains from which good links may be had; in a word, there are a dozen such parts that can be removed from old chassis before selling same to the junk dealer.

Department Makes Money

This dealer is making money out of his second-hand stock room system. He has been carrying it on for several years and it is growing. He has it well hidden away in a part of his building, yet it is an orderly stock room, with plenty of shelves, boxes, crates, etc. How much better it is to keep these old parts in an orderly place than having a few of them lying in the corner of the garage or repair room until they are rusted or covered up with dirt. The second-hand stock room is an institution that any dealer in a city of over 100,000 population can put into operation. You will be surprised how it will work out, and how little attention it will require.

Open Your Mail

LAST week during the Chicago show one distributor mentioned several motor car dealers, who do not open their mail more than once a week and sometimes not that often. This statement was corroborated by several traveling representatives.

Opening the mail is one of the first essentials of successful business. It is as absurd not to answer the telephone as not to open the mail. It is almost impossible to conceive of such a dealer. It is equally impossible to conceive of his continuing in business for long. Such a dealer is unsystematic; system does not enter into his business makeup, yet system is one of the essentials in business. "Get the habit" is the only advice suitable in such a case. Getting the habit of opening the mail promptly is as essential as getting the habit of locking the store or garage each night. It is as essential to good business as three normal meals per day are necessary for good health.

BIG TRACKS PREPARING FOR GOOD RACING SEASON

Chicago, New York, Omaha and Sioux
City Speedways Ready in 1915—
Chicago Meet Scheduled for
June 19

Chairman Richard Kennerdell, of the Contest Board of the American Automobile Association, was the guest of honor at a luncheon given January 28 at the Chicago Automobile Club by Motor Age. The luncheon was also attended by representatives of the leading speedways and by representatives of concerns interested in racing. At this luncheon a get-together spirit was displayed and the speedway people became acquainted with each other for the first time. Plans were discussed, each track representative told of his progress and the car makers' representatives outlined what their respective companies intend doing this season.

As a result of this luncheon the promoters have a fair idea of what support they may look for from the manufacturers and at the same time Chairman Kennerdell was able to straighten out several disputes as to dates.

Representing the tracks were T. E. Myers, of the Indianapolis speedway; F. E. Edwards, of the Chicago speedway; Felix McShayne, of the Omaha speedway; E. R. Schultz, of the Sioux City speedway; F. W. Jencks, of the Elgin Automobile Rotaries Association; J. E. Callender, chairman of the Contest Board of the Chicago Automobile Club; and E. P. Robinson, of Galesburg. E. C. Patterson, backer of Ralph De Palma, represented the owners.

From the reports handed in by the speedway managers, it looks as if both the newcomers, Omaha and Chicago, will be in position to race this summer according to schedule, as work on their respective plants is progressing nicely. Omaha and Sioux City are still in doubt as to their exact dates, the matter being held up until Tacoma can be heard from.

Considerable enthusiasm was aroused by the receipt of a telegram from J. C. Nichols, representing the New York speedway, who stated that all the necessary money has been raised, the land secured and contracts are being let, so it is hoped to have the track done by fall so that a big meet can be held some time in September.

Probably one of the most significant facts connected with the luncheon was

the statement made by J. G. Vincent, chief engineer of the Packard company, who told the racing folk that while he could not speak officially for the Packard company, still he would say that if Packard did not race this year he, himself, would have one or two cars in the big events.

Following the luncheon, Chairman Kennerdell and Clifford Ireland, a western member of the A. A. A. Contest Board, visited the new Chicago speedway in company with Contest Director F. E. Edwards. Both were satisfied as to the progress being made, and issued the necessary sanction for the 500-mile race, which is scheduled to be run on June 19.

OAKLAND AVERAGES 23.7 MILES IN NEAR-ZERO WEATHER

In a blinding wind, and on one of the coldest days of the year, an Oakland 37 roadster with a Marvel carbureter on January 27 made an official economy run on Chicago's boulevards, and accomplished 23.7 miles on 1 gallon of gasoline. The economy test was held under the sanction of the American Automobile Association, the test being supervised by D. S. Hatch, of Motor Age, representing the Contest Board of the A. A. A.

The car was driven by Al. Meisner, of the Chicago Oakland branch, and with him rode E. A. Turner, of the Chicago Automobile Club, as observer. The gasoline and oil used were supplied by the Texas Oil Co., and according to the official report the fuel was 61.25 Beaume gravity at 36 F. This would be 63.65 Beaume at 60 degrees Fahrenheit.

The mercury during the run hovered between 5 and 8 degrees above zero, and an 18-mile wind was blowing from the northwest. This made it impossible to keep the motor warm enough for best economy, and also made hard pulling as the greater portion of the route was in a northerly or westerly direction. Even with the radiator half covered with paper, it was impossible to keep the motor as warm as it should be. The Motometer showed only 10 degrees F. at the start, and never indicated a water temperature of over 170 degrees.

The car is a model 37 four-cylinder roadster with $3\frac{1}{2} \times 5$ motor, and is fitted with a Marvel carbureter, Delco electric system, Stewart vacuum fuel feed, and Goodyear 33 x 4 tires. The weight, according to the officially balanced scales, was 2,875 pounds with its load, and 2,510 pounds without.

BIG FOREIGN MARKET SURE FOR AMERICAN MOTOR CARS

Settling of Business Conditions Will
Bring Huge Export Demand—
European Factories Practically Idle

That when the horror of war is over there will be a general striving to get things back on the old footing of prosperity and that provided the efforts of American producers of motor cars are turned in the proper direction, it may be expected that the exports of cars to nations which are at present belligerent will increase enormously, was the expressed opinion of A. Ludlow Clayden, former editor of the Automobile Engineer of London, in his paper before the last meeting of the Metropolitan Section of the Society of Automobile Engineers.

"The American car has sold in Europe," he said, "and especially, of course, in England, by reason of the usually excellent value for money that it represents."

"So far the American trade has not thought it worth while to manufacture a car or two solely for export, though it has been done in other less progressive countries. The author would like to suggest that the time is now ripe for a real threshing out of this subject and that good might result to both parties, the manufacturers here on the one hand and the buying public in Europe on the other."

"It is, of course, a large undertaking to manufacture a car solely for overseas consumption, but it would be worth while if the assured market was sufficiently big, and it is going to be far bigger than ever before. Remember that many of the European automobile factories are dormant so far as car production is concerned; that not a few of them are destroyed, that their workmen are scattered and even their engineering staffs largely absent, and it is sufficiently obvious that the European trade will hardly be ready to tackle a changed outlook immediately upon the cessation of hostilities."

"Lately the typical American car and the typical European have grown more alike in mechanical detail but less similar in size and pattern. While the moderate sized six is in high favor here it would not be thought moderate across the Atlantic, but rather would be regarded as a Goliath. Consideration of the very high price of gasoline and oil,

of the narrow roads and of the excellent road surfaces shows that the small five seater of fairly low nominal power is much better suited to the conditions.

"The light four with a high-speed motor, a four-speed gearbox and possessing no immense powers of top speed climbing is the best, cheapest and most useful kind of car ever developed for European service. It is hardly suitable here because the road conditions demand greater weight and the taste of the public is different in many matters of detail. For instance, in Europe, it is very far from essential to fit an electric starter, although the presence thereof doubtless has helped to sell a good many cars imported from U. S. A.

"In one respect cars for export have already to be altered, this being that the right hand steering position is needed in England and expected on the Continent, although by rights the now standard left hand arrangement is the correct one for all places with a right hand rule of the road. It is to be questioned whether some of the other alterations to make American cars more acceptable to foreign importers could not be made almost as easily, so that to manufacture for export would not mean manufacturing from A to Z."

Fisk Profits Top \$336,000

The fiscal report of the Fisk Rubber Co. Chicopee Falls, which ended October 31, 1914, shows an increase in net profits of \$336,204 over 1913, the net profits for 1914 being \$942,204. The surplus for 1914 shows an increase of \$229,725, the 1913 surplus being \$285,833 and the 1914 surplus being \$350,000. The 1913 surplus includes a \$42,777 dividend on the preferred stock of the Fisk Rubber Co. of Delaware. Out of the net profits made in the fiscal year 1914 there were retired on December 31, 2,250 shares of first preferred stock, according to the provisions governing the issue and retirement of this stock. The income statement for 1914 with 1913 is compared as follows:

	1914	1913	Increase
Net profits.....	\$942,204	\$606,000	\$336,204
Inventory reserve...	160,000	117,688	42,312
Balance	\$782,204	\$488,312	\$293,892
Preferred dividends..	350,000	285,833	64,167
Surplus for year...	\$432,204	\$202,479	\$229,725

Will Stock American Accessories

Borghoff, Santos & Co., Rio de Janeiro, Brazil, are preparing to take the agency for American-made motor car accessories, and also tools and waterproof canvas.

TIRE PRICE LISTS TOPPLE FOLLOWING GOODRICH CUT

Goodrich Reduces Lists and Eliminates Percentage Discounts—Practically Every Other Maker Contem- plating Revisions

By way of placing its dealer business on a firmer basis, the B. F. Goodrich Co., Akron, O., has completely revised its tire price lists and in doing so has adopted the unusual method of eliminating all discounts to the trade or otherwise insofar as such discounts are figurable on a percentage basis. Following the revision which places considerably lower figures on every size produced, it is practically certain that other makers will announce new lists before the week is out. Just what the new figures will be has not been announced as yet in any case, though a canvass of all the prominent tire makers reveals that with few exceptions, revisions now are being considered.

The reduction which has been made in Goodrich prices is not the same for every size. In fact, Goodrich officials are careful to point out that the word percentage no longer is applicable to the business between the Goodrich company and its dealers. Instead, the new prices have been built up from the cost price and placed at a level which will allow the dealer a profit. That the profit will be slightly lower than has been the case in the past is admitted, though it is pointed out that the new list prices are so much lower than heretofore that increased sales should more than offset the difference.

Following are the old and new Goodrich prices on some of the more popular plain tread sizes:

Size	Old	New
30 x 3	\$11.70	\$9.00
30 x 3½	15.75	11.60
32 x 3½	16.75	13.35
34 x 4	24.35	19.05
36 x 4½	35.00	27.35
37 x 5	41.95	32.30

That these new prices will be met by at least one of the big companies is admitted, though formal announcement will not be made until next week. Of the other makers, those who have replied to Motor World inquiries are as follows:

UNITED STATES

"Nothing definite has been decided as yet."

AJAX

"No definite decision will be reached before the end of the week."

BRAENDER

"No new prices will be announced for a day or so; list will not be revised though discounts to trade will be increased slightly."

KELLY-SPRINGFIELD

"Nothing definite has been decided as yet."

MARATHON

"Current prices of high grade rubbers and tire fabrics do not warrant the recent cut in tire prices. Marathon tires are built for the users who desire the most mileage and best service for the money invested. In line with this policy and our determination to place quality above all we cannot consistently meet the reductions made by our competitors."

McGRAW

"No change in list prices at present."

KNIGHT

"As the company referred to in your telegram states in their advertisement covering their new list, 'The price list shall accurately and reliably measure the value which each manufacturer intends to give the consumer.' You, as well as all dealers, can appreciate the truth of this statement which covers our policy. The list, therefore, on Knight tires will be changed but little if any."

MICHELIN

"Nothing decided yet though matter is being considered."

Goodrich Earnings 5.65 Per Cent

The B. F. Goodrich Co., Akron, earned in 1914 5.65 per cent on its \$60,000,000 common stock, compared with 0.83 per cent in 1913 on the same stock. The net profits for 1914, ended December 31, approximated \$5,440,000. This amount added to the surplus on December 31, 1913, \$705,900, brought the total undivided profits up to \$3,177,400, after deducting the four quarterly dividends of 1¼ per cent on the preferred stock outstanding, together with a provision of \$900,000, July 1, 1914, for the redemption of preferred stock, as called for by the articles of incorporation.

The report states that the company's financial position was materially strengthened during the past year, the amount of quick assets over current liabilities on December 31 last showing a gain over the previous year of approximately \$2,950,000. The contingent liability in respect of bankers' loans made on behalf of the Societe Francaise-B. F. Goodrich, and which existed at December 31, 1913, has been entirely liquidated. The company has on hand cash to the amount of \$4,175,000 and has no bills payable outstanding. The current assets amount to approximately \$20,300,000 and the current liabilities to \$1,470,000. The company has no bonded debt.

At the regular quarterly meeting of the directors held on January 27, there was retired, subject to the approval of the stockholders at their annual meeting on March 10, 11,000 shares of preferred stock, which, together with the 9,000 shares appropriated at the July meeting of the board, makes a total retirement of 20,000 shares.

In connection with the dividend policy of the company, the report states that, although a dividend of 3½ per cent was declared on the preferred stock, 1¼ per cent payable April 1, and 1¼ per cent payable July 1, at a recent meeting, no action was taken or contemplated in the near future regarding dividends on the common stock.

NEW EIGHT, SIX AND FOUR ADDED TO MARION LINE

All Alike Except in Motors and Chassis
Length—Eight Costs \$1,500, Six
\$1,350 and Four \$1,250—All
Fully Equipped

The Mutual Motors Corp., Indianapolis, Ind., which has been manufacturing the Marion cars, has announced three new models, an eight, six, and a four. All three of the models are built of standard units, the eight having a V-type, $3\frac{1}{2}$ x $4\frac{1}{2}$ motor, and wheelbase of 115 inches. It sells at \$1,500 either as a roadster or five-passenger touring car. The four has a Continental block L-head engine, $3\frac{1}{4}$ x 5; and the same wheelbase as the eight. It sells for \$1,250. The six has a 3 x 5 block L-head engine, a 122-inch wheelbase and sells for \$1,350. The equipment in each case includes such fittings as one-man top, demountable rims, with one extra, rain-vision, built-in windshield and graphite lubricated springs. In every respect of general design, except engine and chassis length, the three cars are identical. The design includes a dry disk clutch and three-speed gearset in unit with the engine and spiral-bevel drive.

Motor equipment includes Bosch magnet, Gray & Davis lighting and starting, Stewart vacuum fuel feed from a tank at the rear, and Fedders honeycomb radiator. The lighting system includes double bulb headlights, for city or country driving. Tires are 34 x 4.

Appoint Receiver for Vulcan

Following a creditors' petition to have the Vulcan Mfg. Co., Painesville, O., declared bankrupt, United States District Judge Clarke appointed Attorney Carl D. Friebolin receiver. Friebolin says the company will make an offer of settlement with the 400 creditors whose names are on its books.

The involuntary bankruptcy action was filed by Attorney Louis J. Grossman, representing the creditors. He maintains the liabilities of the Vulcan company are in excess of \$100,000 and that the company's officers have been endeavoring to straighten out its financial difficulties through the sale of property not affected.

The federal court will appoint three appraisers to estimate the company's assets. When this is done the directors will then decide upon an offer to creditors, according to Friebolin. He said

the company was preparing to open a factory branch in Cleveland and that orders on hand and unfilled total more than 1,000 cars. Friebolin believes a re-adjustment will be effected within a month.

Changes Among Prominent Tradesmen

John Mowe has become affiliated with the Kelly-Springfield Co. of Boston.

Fred Halligan, formerly with the Boston Locomobile Co., is now in charge of the used car department of the Chalmers Motor Co., of Massachusetts.

A. M. Welch, formerly a territorial representative of the Stevens-Duryea Co., has joined the Nordyke & Marmon Co. He will cover the Middle West.

Frederick Halligan, for a long time with the Boston branch of the Locomobile company, resigned last week to join forces with the Chalmers Motor Car Co.

I. D. Shaw has opened offices in the Majestic building, Detroit, as local representative of the Cincinnati Ball Crank Co., Cincinnati, O.

J. A. Holihan, president and general manager of the Holihan Mfg. Co., Detroit, has resigned and will enter another line of business.

B. R. Gertig, formerly district representative for the White Co., Cleveland, O., has again joined the selling force of the Blevins Auto Sales Co., Toledo distributors for Studebaker cars.

B. A. Simpson, during the last six years with the Buick Omaha agency, has been appointed manager of the retail business of the Apperson Jack Rabbit Automobile Co., 2417 Farnam street, Omaha.

E. D. Smith, until recently manager of the car order department of the Chalmers Motor Co., has resigned to become manager of the Detroit branch of the Reed Self-Adjusting Weather Strip Co., Wichita, Kan.

Another Large Stearns Distributer

The McIntyre Automobile Co., Omaha, Neb., has been designated by the F. B. Stearns Co., Cleveland, its Nebraska and Western Iowa distributor. The contract is said to be one of the largest ever given a single distributor by the Stearns company.

Piston Rings from Indianapolis

A new type of piston ring, styled "K. and M. Conform," is being made by the modern Electric Motor & Machine Co., Indianapolis, Ind., and marketed by the Superior Auto Parts Co. L. J. Eby is sales manager of the concern.

FEDERAL REDUCES PRICE AND ADDS 3½-TON TRUCK

Payments, Maintenance and Business
Methods Discussed at Three-Day
Business Convention—Proceedings
Closed by Big Banquet

The Federal Motor Truck Co., Detroit, has reduced the price of its 1½-ton worm drive truck from \$1,900 to \$1,800 and has added a 3½-ton worm-driven chassis at \$2,800. This action comes as one result of a three-day convention which was brought to a close January 27, and which was attended by 150 representative firms all over the country.

Among the many subjects which were discussed at the convention was the matter of "Time Payments," by H. R. Vincent, Chicago; "Maintenance Operating Plans" and "How to Secure and Handle Big Business," by C. K. Thomas, New York. H. S. Dunlavy, Chicago, gave a talk on competition. The evils of price cutting were brought to the attention of the dealers, and it was unanimously decided to continue the policy of giving one fair price to all purchasers.

The climax of the convention was the banquet given at the Hotel Ponchartrain. Besides spending much time in the shops of the Federal plant the dealers also visited the plant of the Detroit-Timken Axle Co.

Willys Out of Gramm and Garford

According to an announcement made January 17, John N. Willys has withdrawn from the Gramm Motor Truck Co., of Lima, of which he gained control several years ago by purchasing more than \$500,000 of the \$750,000 common stock of the corporation. The capital of the company is \$1,250,000. Willys interests have also been disposed of in the Garford Motor Truck Co., Elyria, O., and the Gramm and Garford agencies in Boston, New York and Philadelphia. The Geiger-Jones Co., of Canton, widely known as industrial bankers, will be the dominant factor in the reorganization of the company. The banking company has acquired from Mr. Willys all of his interests and a meeting was held with the Lima stockholders consisting of D. C. Dunn, Henry Deisel, Sr., E. A. Macbeth, Henry Freuh, B. A. Gramm, J. E. Morris, D. W. Morris, D. R. O'Connor, F. X. Seiber, C. L. Wall, C. W. Werst, Jonas Wohlgemuth and P. A. Kahle. E. A. Williams, Jr., formerly in charge of the Lima plant for

the Willys-Overland Co., will be president and general manager. The Gramm company will make and sell Gramm and Garford trucks at Lima.

Hoyt Heads Detroit Pressed Steel

At the annual meeting of the stockholders of the Detroit Pressed Steel Co., the following officers were elected: President, Hobart D. Hoyt; vice-president and general manager, Carl H. L. Flinterman; secretary-treasurer, Edward E. Caulkins. These officers and R. F. Flinterman, DeWitt H. Taylor, Kirby A. White and J. Walter Drake, make up the board of directors.

Republic Approves Stock Issue

At the annual meeting of the stockholders of the Republic Rubber Co., Youngstown, O., the issuance of \$3,000,000 of preferred stock was approved, but formal action will not be taken until the special meeting to be held some time in February. It was stated that \$2,500,000 will be used to replace stock of this character, still outstanding and which matured September 1, 1914, while the remaining \$500,000 will be used for future extensions of the plant.

Badger Brass Reelects Officers

At the annual meeting of the Badger Brass Mfg. Co., Kenosha, Wis., manufacturing Solar lamps, Gordon Yule was elected a director to fill the vacancy caused by the death of his father, William L. Yule. Officers were reelected as follows: President, George A. Yule; vice-president, William H. Yule; secretary, L. J. Keck; treasurer, Richard H. Welles.

Grant Motor Co. Elects Officers

The following officers were elected for the current year at the annual meeting of the stockholders of the Grant Motor Co., Findlay, O.: President, David A. Shaw; vice-presidents, George D. Grant and George S. Salzman; secretary and sales manager, George S. Waite. The board of directors consists of these officers and E. A. Dorsey, J. M. Howe, Roger R. Hall and Charles A. Grant.

Metal Bodies From Worcester

The building of metal bodies has been started at Worcester, Mass., by George Demers & Son, long in the blacksmith, carriage building and automobile repairing business at 98 Union street. The work will be in charge of N. Allard, for 14 years one of the expert body builders at the Knox factory at Springfield, Mass., and who later worked for the Springfield Metal Body Co.

F. R. P. CARS TO COMPETE IN INDIANAPOLIS RACE

Finley Robertson Porter Co.'s Cars to Have Knight Motors With Long Stroke and High Speed—Three Cars Will Be Campaigned

The Finley Robertson Porter Co., Port Jefferson, L. I., will be represented at the Indianapolis 500-mile race in May by at least three cars, according to Finley R. Porter, president of the company.

It is the intention of the company to compete in all important events of the year. Porter states that the announcement of the intended move of the company to Indianapolis was a misunderstanding, as the factory will continue to be located in the plant at present located at Port Jefferson.

The four-cylinder Knight type motor which will be used in the F. R. P. car will be a $3\frac{3}{4} \times 6\frac{1}{2}$ -inch, four-cylinder type, capable of 3,500 r. p. m. The piston displacement is 270 cubic inches, and the wheels are shod with 32×4 tires, giving a low chassis.

WORCESTER DEALERS TO TAKE UP USED CAR MARKET

The Worcester Automobile Dealers Association is now considering joining in the association handling the used car market reports. The matter has been taken up and O. P. Tyler, one of the prominent dealers who attended the meeting during the New York show, has submitted a report to the association and it will be taken up at the next meeting. Many of the dealers have expressed themselves favorably on the matter. Worcester dealers may join with the Boston men for a New England organization working in conjunction with the Chicago association. In that event Springfield, Providence, Manchester, Portland and other New England cities would join the movement.

Lewis Heads L-P-C Motor Co.

William Mitchell Lewis was elected president at the annual meeting of the stockholders of the L-P-C Motor Co., Racine, Wis. J. M. Cram was made vice-president; F. S. Gordon, secretary; and G. B. Wilson, treasurer. These officers and Rene M. Petard were elected directors for the current year. The capital stock of the company was increased from \$250,000 to \$350,000. During the first 9

months of operation 380 cars were made and sold and that the business outlook is most satisfactory.

Grand Rapids Dealers Band Together

A temporary organization of motor car and accessory dealers has been formed in Grand Rapids, Mich., O. H. Goldsmith, of the Tire Shop, being chairman; E. R. Corbin, of the Auto Equipment & Supply Co., secretary, and F. W. Withrow, of the Standard Tire Repair Co., treasurer.

Remy Detroit Plant Taking Shape

Construction on the new Detroit plant of the Remy Electric Co., which is to move from Anderson, Ind., will be started in a few days when ground will be broken for the two-story 50 x 150 engineering building. This is to be the first of the various buildings which will be erected on Mt. Elliott and the Boulevard.

Electric Men to Meet

Plans have been made for a 2-day convention of electric car and truck manufacturers, agents, battery and lighting station officials during the Boston Automobile show. The first session will open on March 10, and headquarters will be established at the Boston City Club.

Four New Accounts For Peacock

The Clarence N. Peacock Co., New York, has been appointed Eastern distributor for the Standard Steel Spring Co., the S-M-H chain tire tool, the Clincher tire plow and the Boyce hand-operated warning signal. These are in addition to the Ames equalizing springs.

Motor Car Securities Quotations

	Jan. 30, 1914	Jan. 30, 1915
	Bid	Asked
Ajax-Grieb Rubber Co., com.	105	115
Ajax-Grieb Rubber Co., pfd.	98	101
Aluminum Castings, Pfd.	97	100
Chalmers Motor Co., com.	92	96
Chalmers Motor Co., pfd.	93	96
Firestone Tire & Rubber Co., com.	244	270
Firestone Tire & Rubber Co., pfd.	105	108
General Motors Co., com.	45	52
General Motors Co., pfd.	224	234
B. F. Goodrich Co., com.	86	92
B. F. Goodrich Co., pfd.	87	114
Goodyear Tire & Rubber Co., com.	225	230
Goodyear Tire & Rubber Co., pfd.	98	101
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	5	11
International Motor Co., pfd.	15	10
Kelly-Springfield Tire Co., com.	53	55
Kelly-Springfield Tire Co., 1st pfd.	125	130
Kelly-Springfield Tire Co., 2nd pfd.	115	117
Maxwell Motor Co., com.	44	57
Maxwell Motor Co., 1st pfd.	28	34
Maxwell Motor Co., 2nd pfd.	84	88
Miller Rubber Co., com.	124	130
Miller Rubber Co., pfd.	124	130
Packard Motor Car Co., com.	95	100
Packard Motor Car Co., pfd.	95	100
Peerless Motor Car Co., com.	15	20
Peerless Motor Car Co., pfd.	75	80
Portage Rubber Co., com.	40	45
Portage Rubber Co., pfd.	40	45
Reo Motor Truck Co., com.	54	57
Reo Motor Truck Co., pfd.	147	150
Stewart-Warner Spdr. Corp., com.	52	53
Stewart-Warner Spdr. Corp., pfd.	94	100
Studebaker Corp., com.	25	30
Studebaker Corp., pfd.	77	80
Swire-Tire Rubber Co., com.	71	75
U. S. Rubber Co., com.	59	60
U. S. Rubber Co., pfd.	105	107
White Co., pfd.	110	110
Willys-Overland Co., com.	94	97
Willys-Overland Co., pfd.	92	94

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT											
K	4-4½x5½	Spidf	Zenith	A-Lite	Disk	3	116	34x4	1,785	.....	.....
L	4-4½x5½	Spidf	Zenith	A-Lite	Disk	3	121	36x4½	2,085	.....	.....
F	6-3½x5½	Hosch	Zenith	A-Lite	Disk	4	130	35x4½	2,190	2,190	2,290
H	6-3½x4½	Battery	Zenith	Remy	Disk	4	116	34x4	1,685	.....	.....
ALLEN											
34	4-3½x5	Wths	Stmbg	Wths	Cone	3	110	32x3½	895	895	.....
ALTER											
4-27	4-3½x4½	Remy	Holley	Remy	Disk	3	106	30x3½	685	685	.....
APPELSON											
4-40	4-4 x5	.....	.....	.....	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	.....	.....	.....	Band	3	120	36x4	1,685	1,685	.....
6-60	6-4½x5	.....	.....	.....	Band	3	.....	38x4	2,200	2,250	2,350
6-45	6-3½x5½	.....	.....	.....	Band	3	122	34x4	1,485	.....	.....
ARBENZ											
1915	4-4½x5½	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,835	.....
ARGO											
Argo	4-2 5-16x4	A. Kent	Argo	.....	Cone	2	90	28x2½	295	.....	.....
AUBURN											
4-38	4-3½x5	.....	Rafid	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	.....	Rafid	.....	Cone	3	126	34x4	1,550	.....	.....
6-47	6-3½x5½	Bosch	Rafid	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN											
66	6-4½x6	Wths	Master	Wths	Disk	6	141	34x4½	3,600	3,600	3,600
RAUER											
R	4-4½x5	Mea	Shblr	Emrsn	Disk	3	110	34x3½	875	1,000	.....
BRISCOE											
B	4-3½x5½	Spidf	.....	Apico	Cone	3	107	30x3½	785	785	.....
BUICK											
C-24-5	4-3½x3½	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	Delco	Marvel	Delco	Cone	3	120	36x4½	1,650	.....	1,650
CADILLAC											
51	8-3½x5½	Delco	Own	Delco	Disk	3	122	36x4½	1,975	1,975	1,975
CARTERCAR											
9	4-3½x5	Delco	Shblr	Delco	.....	.....	106	33x4	1,250	.....	.....
CASE											
35	4-4½x5½	Bosch	Rafid	Wths	Disk	3	120	35x4½	1,600	.....	.....
40	4-4½x5½	Hosch	Rafid	Wths	Disk	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	Wths	Stmbg	Wths	Disk	3	115½	34x4	1,350	.....	.....
CHADWICK											
19	6-5 x6	Bosch	Own	Wths	Band	4	.....	37x5r	5,500	5,500	5,500
CHALMERS											
26-H	6-3½x5½	A. Kent	Rafid	Entz	Disk	3	125½	34x4½	1,650	1,725	.....
M-6	6-4 x5½	Bosch	Rafid	Entz	Disk	4	132	36x4½	2,400	2,400	.....
32	6-3½x5	A. Kent	Rafid	G & D	Disk	3	120	34x4	1,400	.....	.....
CHANDLER											
15	6-3½x5	Bosch	Rafid	G & D	Disk	3	120	34x4	1,295	.....	.....
CHEVROLET											
H-4	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	.....	875	.....
H-2	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE											
4-40	4-4½x5½	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,865
6-51	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	Delco	Stmbg	Delco	Cone	3	136	37x5	2,465	2,465	2,465
CRAWFORD											
6-35	6-3½x5	Wths	Stmbg	Wths	Disk	3	120	34x4	1,850	1,850	.....
CROW											
E-42	4-4 x5	G & D	Shblr	Emrsn	Disk	3	114	33x4	1,150	1,165	.....
E-52	4-4½x5½	G & D	Shblr	Emrsn	Disk	3	120	34x4	1,475	1,600	.....
E-62	6-3½x5½	G & D	Shblr	Emrsn	Disk	3	130	36x4	1,895	1,895	.....
C.E.Jr	4-3½x4½	Disco	Holley	Disco	Disk	3	104	30x3½	725	.....	.....
CUNNINGHAM											
8	4-4½x5½	Undec	Stmbg	Undec	Disk	3	120	37x5	.....	.....	3,750
CYCLEPLANE											
Tour	4-2½x4	A. Kent	Own	.....	Disk	3	108	28x3	350	.....	.....
Trav	2-3½x4	A. Kent	Shblr	.....	.....	2	96	28x2½	250	.....	.....
DAVIS											
38-A	4-3½x5	Wths	Stmbg	Wths	Cone	3	112	34x4	1,235	1,235	.....
6-D	6-3½x5½	Bosch	Stmbg	G & D	Disk	4	128	37x4½	2,185	.....	.....
DETROITER											
C	4-3½x5	Remy	Stmbg	Remy	Disk	3	112	32x3½	.....	885	.....
DILE											
A	4-2½x4	Bring	Holley	.....	Disk	3	96	28x3	485	.....	.....
DODGE											
...	4-3½x4½	Elsmn	Own	N E	Cone	3	110	32x3½	.....	785	.....
DORRIS											
LA-4	4-4½x5	Wths	Stmbg	Wths	Disk	3	121	36x4½	2,200	2,250	.....
DORT											
Four	4-3 x4	Conn	.....	.....	Cone	3	.....	36x3	495	.....	.....
Five	4-3½x5	Conn	.....	.....	Cone	3	.....	36x3½	.....	680	.....
DRIGGS-SEABURY											
C	4-2½x4	Mgnto	.....	.....	Cone	2	100	28x3	395	.....	.....
A	4-2½x4	Mgnto	.....	.....	Frm Trs	109	.....	395	.....	.....	.....
EMPIRE											
31-40	4-3½x4½	Remy	Holley	Remy	Disk	3	108	32x3½	975	975	.....
ENGER											
6-50	6-3½x5	A. Kent	Rafid	G & D	Disk	3	125	34x4	1,495	.....	1,495
FIAT											
55	4-130x170	Bosch	Own	Wths	Disk	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	Bosch	Own	Wths	Disk	4	135	37x5r	5,150	5,150	5,150
54	4-110x150	Bosch	Own	Wths	Disk	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS											
82-E	4-4½x5½	Spidf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	.....
90-E	6-4½x5½	Conn	Rafid	G & D	Disk	3	132	36x4	2,500	2,850	.....
FORD											
T	4-3½x4	Ford	Holley	.....	Disk	2	100	30x3	440	490	.....
FRANKLIN											
6-30	6-3½x4	Elsmn	Own	Dyneto	Disk	3	120	34x4½	2,150	2,150	.....
F. R. P.											
45-B	4-4 3-5x6½	Bosch	Stwrt	Bosch	Cone	4	110	36x4	All bodies to order	.....	.....
GLIDE											
30	4-3½x5	Wths	Shblr	Wths	Disk	3	114	32x4	1,195	1,195	.....
GRANT											
M	4-2½x4	Swiss	Mayer	A-C	Cone	2	90	28x3	425	.....	.....
T	6-2½x4½	A. Kent	Mayer	A-C	Cone	3	106	30x3½	.....	795	.....
GREAT WESTERN											
A	4-4½x5½	Kingstn	Kingstn	G & D	Cone	3	117	36x4	1,710	1,710	.....
B	4-3½x5½	Kingstn	Kingstn	Bosch	Cone	3	117	34x4	2,200	.....	.....
HALLADAY											
6-40	6-.....	Wths	Stmbg	Wths	Disk	3	.....	34x4	.....	1,385	.....
HAYNES											
30	6-3½x5	Remy	Rafid	L-N	Disk	3	121	34x4	1,485	1,485	.....
31	6-4½x5½	Simms	Rafid	L-N	Band	3	130	38x4½	2,250	.....	.....
33	6-3½x5	Remy	Rafid	L-N	Disk	3	127	35x4½	.....	1,550	.....
32	4-4½x5½	Simms	Stmbg	L-N	Band	3	118	34x4	1,680	.....	.....
HERFF-BROOKS											
4-40	4-4½x5	Bosch	Stmbg	Apico	Cone	3	118	34x4	1,100	1,100	.....
6-50	6-4 x4½	Bosch	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	.....
HERRESHOFF											
4-16	4-2½x3½	A. Kent	Ctrr	Dyneto	Cone	3	94	28x3	500	.....	.....
HUDSON											
6-40	6-3½x5	Delco	Zenith	Delco	Disk	3	123½	34x4	1,550	.....	1,550
6-54	6-4½x5½	Delco	Zenith	Delco	Disk	4	135	36x4½	.....	2,350	.....
HUPMOBILE											
H	4-3½x5½	Bosch	Zenith	Wths	Disk	3	108	33x4	1,050	1,050	.....
K	4-3½x5½	A. Kent	Zenith	Wths	Disk	3	119	34x4	1,200	1,200	1,225
IMPERIAL											
64	4-3½x5	A. Kent	Stmbg	G & D	Disk	3	115	32x3½	.....	1,085	.....
58	6-3½x5½	Spidf	Stmbg	N E	Disk	3	130	36x4½	.....	2,200	.....
66	6-3 x5	.....	.....	.....	Disk	3	.....	33x4	.....	1,285	.....
INTER-STATE											
T	4-3½x5	Remy	Shblr	Remy	Cone	3	110	33x4	.....	1,000	.....
JACKSON											
46	4-4½x5½	Remy	Shblr	A-Lite	Cone	3	117	34x4	1,375	1,375	.....
48-6	6-3½x5	Delco	Stmbg	Delco	Cone	3	125	34x4½	.....	1,650	.....
JEFFERY											
Four	4-3½x5½	Bosch	Rafid	U S L	Cone	4	116	34x4	1,525	1,450	.....
Six	6-3½x5½	Bosch	Rafid	U S L	Disk	4	133½	34x4½	.....	2,400	.....
Child	6-3 x5	Bosch	Stmbg	Bljr	Disk	4	122	34x4	1,650	1,650	.....
KEARNS											
L	4-2½x4	Bring	Zenith	A-C	Cone	3	100	28x3	450	.....	.....
KING											
...	4-3 15-16x5	A. Kent	Stmbg	W. Lrnd	Disk	3	113	33x4	1,075	1,075	.....
...	8-2½x5	A. Kent	Zenith	W. Lrnd	Disk	3	113	33x4	.....	1,350	.....
KISSEL											
4-38	4-4½x5½	Wths	Stmbg	Own	Cone	3	121	34x4	1,450	1,450	1,550
6-42	6-4½x5½	Wths	Stmbg	Kissel	Cone	3	120	34x4	1,650	1,650	1,850
6-48	6-4 x5½	Mea	Rafid	Kissel	Cone	4	132½	36x4½	2,350	2,350	2,500
6-60	6-4½x5½	Bosch	Rafid	Kissel	Cone	4	142	37x5	3,150	3,150	3,150
KLINE											
6-42	6-3½x5½	Wths	.....	Wths	Disk	3	123	34x4	1,750	1,750	.....
6-42A	6-3½x5½	Wths	.....	Wths	Disk	3	123	36x4½	.....	1,800	1,800

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT	O 4-3x4 M 4-3x4	Disco Bosch	Johnsn Stmbg	Disco N E	Disk Disk	3 108 3 108	32x3 1/2 32x3 1/2	850 995	850 995	....	....
LAMBERT	48-C 4-3x4 68-C 4-4 1/2x5 1/2	Brggs Brggs	Shblr Shblr	Brggs Brggs	.... ....	112 117	32x3 1/2 34x3 1/2	1,200 1,565	1,200 1,565	....	....
LENOX	Four 4-4 1/2x5 1/2 Six 6-3x5 1/2	Wths Wths	Own Own	Wths Wths	Cone Cone	3 118 3 130	34x4 1/2 34x4 1/2	2,000 2,465	2,000 2,465	....	....
LEWIS	... 6-3x5 1/2	Brggs	Stmbg	Remy	Disk	3 135	36x4	1,600	1,600	....	....
LEXINGTON	Four 4-3x5 1/2 6-L 6-3x5 6-M 6-4 1/2x5	Wths Wths A. Kent	Shblr Shblr Stmbg	Wths Wths Jesco	Disk Disk Cone	3 115 3 128 3 130	34x4 34x4 36x4 1/2	1,375 1,875 2,575	1,375 1,875 2,575	....	....
LOCOMOBILE	M-5 6-4 1/2x5 R-5 6-4 1/2x5	Bosch Bosch	Own Own	Wths Wths	Disk Disk	4 140 4 132	37x5 37x5	5,100 4,400	5,100 4,400	....	....
LUVERNE	700 6-4 x5	Bosch	Shblr	Jesco	Disk	3 123	36x4 1/2	2,500	2,500	....	....
LYONS-KNIGHT	K-4 4-4 1/2x5 1/2	Simms	Stmbg	N E	Disk	3 130	37x5	2,900	2,980	....	....
MARION	... 8-3 1/2x4 1/2 ... 6-3 x5 ... 4-3x5	Bosch Bosch Bosch	.... .... ....	G & D G & D G & D	Disk Disk Disk	3 115 3 122 3 115	34x4 34x4 34x4	1,500 1,350 1,250	1,500 1,350 1,250	....	....
MARBON	41 6-4 1/2x5 1/2 48 6-4 1/2x6	Bosch Bosch	Stmbg Zenith	Bosch Both	Cone Disk	3 132 1/2 3 145	36x4 1/2 37x5	3,250 5,000	3,250 5,000	....	....
MAXWELL	25 4-3x4 1/2	Simms	Kingstn	Simms	Cone	3 103	30x3 1/2	725	750	....	....
McFARLAN	T 6-4 x6 X 6-4 1/2x6	Wths Wths	Stmbg Stmbg	Wths Wths	Cone Cone	3 132 3 132	36x4 1/2 36x4 1/2	2,590 2,900	2,590 2,900	....	....
McINTYRE	25 4-3 1/2x5 1/2 6-40 6-3x4 1/2	Bosch Brggs	Stmbg Stmbg	G & D Brggs	Cone Disk	3 106 3 120	32x3 1/2 35x4	850 1,275	850 1,275	....	....
MERCER	Spdstr 4-3x6 1/2 Rdstr 4-3x6 1/2	Bosch Bosch	Zenith Zenith	U.S.L. U.S.L.	Disk Disk	4 130 4 130	34x4 1/2 34x4 1/2	2,750 3,000	2,750 3,000	....	....
METEOR	42 4-4 x5 45 6-3x5	A. Kent A. Kent	Stmbg Stmbg	Spldf Spldf	Disk Disk	3 114 3 128	34x4 35x4	1,075 1,395	1,075 1,395	....	....
METZ	22 4-3x4 25 4-3x4	Bosch	Own A.W.T.	G & D G & D	.... ....	96 105	30x3 32x3 1/2	495 600	495 600	....	....
MITCHELL	Four 4-4 x5 1/2 Six 6-4 x5 1/2 7-8 6-4 1/2x7 8-8 6-4 1/2x6	Conn Conn Remy Remy	.... .... .... ....	Spldf Spldf Remy Remy	Cone Cone Cone Cone	3 116 3 123 3 144 3 132	34x4 36x4 37x5 36x4 1/2	1,250 1,585 2,350 1,895	1,250 1,585 2,350 1,895	....	....
MOLINE-KNIGHT	... 4-4 x6 40 4-3 1/2x5	Bosch Conn	Shblr Conn	Wgner	Cone Cone	4 128 3 118	36x4 1/2 31x4	2,500 1,475	2,500 1,475	....	....
MONARCH	Six 6-3 1/2x5	A. Kent	Zenith	W. Lnd	Cone	3 125	33x4	1,250	1,275	....	....
MONROE	M-2 4-3 x3 1/2	Conn	Zenith	A-Lite	Cone	3 96	30x3	400	....	....	....
MOON	4-38 4-3x5 6-40 6-3x5 6-50 6-3x5 1/2	Delco Delco Delco	Rafid Rafid Rafid	Delco Delco Delco	Disk Disk Disk	3 122 3 122 4 130	34x4 34x4 35x4 1/2	1,350 1,575 2,150	1,350 1,575 2,150	....	....
MORSE	D 4-4x5	Eismn	Stmbg	G & D	Disk	4 127	36x4 1/2	3,600	3,600	....	....
NATIONAL	AB 6-3x5 1/2	Eismn	Rafid	Wths	Cone	3 134	36x4 1/2	2,375	2,375	....	....
NORWALK	F 6-3 1/2x5 1/2	A. Kent	Rafid	G & D	Disk	4 131	37x4	1,875	....	....	....
OAKLAND	37 4-3 1/2x5 49 6-3x5 Spdstr 4-3 1/2x5	Delco Delco Delco	Marvel Johnsn Marvel	Delco Delco Delco	Cone Cone Cone	3 112 3 123 1/2 3 112	33x4 35x4 1/2 33x4	1,150 1,685 1,100	1,150 1,685 1,100	....	....
OGREN	Six 6-3x5 1/2	Bosch	Rafid	B-Rahrn	....	3	....	2,500	2,500	....	....
OLDSMOBILE	42 4-3 1/2x5 55 6-4 1/2x5 1/2	Delco Delco	Marvel Marvel	Delco Delco	Cone Cone	3 112 3 139	33x4 36x5	1,285 2,975	1,285 2,975	....	....
OVERLAND	80 4-4 1/2x4 1/2 81 4-4 x4 1/2 82 6-3 1/2x5 1/2	Bosch Spldf Bosch	Shblr Shblr Shblr	A-Lite A-Lite A-Lite	Cone Cone Cone	3 114 3 106 3 125	34x4 33x4 35x4 1/2	1,050 795	1,075 850....	....	....
OWEN	... 6-3 1/2x5 1/2	Owen	Master	O.M.	O.M.	136	35x5	3,750	3,750	....	....
PACKARD	3-38 6-4 x5 1/2 5-48 6-4 1/2x5 1/2	Bosch Bosch	Own Own	Bljur Bljur	Plate Plate	3 140 3 144	37x5 37x5	3,750 4,750	3,750 4,750	3,850 4,850	....
PAIGE	Six 6-3 1/2x5 1/2 36 4-4 x5	Bosch Bosch	Rafid Stwrt	G & D G & D	Disk Disk	3 124 3 116	34x4 34x4	1,395 1,075	1,395 1,075	....	....
PARTIN-PALMER	20 4-3 1/2x4 28 4-3 1/2x5 1/2	A. Kent A. Kent	Muir Stmbg	G & D G & D	Disk Cone	3 96 3 115	28x3 33x4	495	495....	....	....
PATERSON	4-32 4-3 1/2x5 6-48 6-3 1/2x5	Delco Delco	Stmbg Stmbg	Delco Delco	Cone Cone	3 112 3 124	33x4 34x4	1,095 1,495	1,095 1,495	....	....
PATHFINDER	... 6-3x5 1/2	Wths	Shblr	Wths	Disk	4 125	34x4 1/2	2,323	2,323	....	....
PEERLESS	54 4-3x5 55 6-3 1/2x5 48-6 6-4 1/2x6	A. Kent A. Kent Bosch	Stmbg Stmbg Own	G & D G & D G & D	Disk Disk Band	3 113 3 121 4 137	34x4 34x4 37x5	2,000 2,250 4,900	2,000 2,250 5,000	....	....
PETER PAN	3-E 4-2 1/2x4 1/2	Brng	....	....	Disk	3 110	29x3 1/2	650	....	....	....
PIERCE-ARROW	C-3 6-4 x5 1/2 H-3 6-4 1/2x5 1/2 A-3 6-5 x7	Bosch Bosch Bosch	Own Own Own	Wths Wths Wths	Cone Cone Cone	4 134 4 142 4 147 1/2	36x4 1/2 37x5 38x5 1/2	4,300 4,900 5,900	4,300 4,900 6,000	....	....
PILOT	55 6-3 1/2x5 1/2 75 6-4 1/2x6	Wths Wths	Shblr Crt	Wths Wths	Cone Cone	3 126 3 132	34x4 37x4 1/2	1,885 2,885	1,885 2,885	1,985 2,885	....
PREMIER	6-50 6-4 x5 1/2	Eismn	Rafid	Remy	Disk	3 132	36x4 1/2	1,985	1,985	1,985	....
PRATT	6-50 6-3 1/2x5 1/2	A. Kent	Rafid	G & D	Disk	4 133	37x4 1/2	2,150	2,150	2,250	....
PULLMAN	Jr 4-3 1/2x4 1/2 6-48 6-3 1/2x5 1/2	Spldf Simms	Stmbg Stmbg	Spldf Wths	Disk Disk	3 110 4 134	30x3 1/2 36x4 1/2	740 2,500	740 2,500	....	....
RAYFIELD	20 4-2 1/2x4 1/2	....	Own	....	Disk	3 96	28x3	335	335	....	....
R-C-H	K 4-3 1/2x5	Bosch	B-D	W. Lnd	Cone	3 110	32x3 1/2	775	775	....	....
REGAL	D 4-3x5 ... 8-2 1/2x4 1/2 ... 4-3 1/2x3 1/2	A. Kent	Stwrt Stwrt Spldf	Bosch H. Rahmr Spldf	Cone	3 112 3 112 3 106	33x4 33x4 30x3 1/2	1,065 1,250 650	1,065 1,250 650	....	....
REMINGTON	... 4-3 1/2x4 Ghnd 8-3 1/2x4 1/2	A. Kent A. Kent	.... Zenith	W. Lnd G & D	Cone Disk	3 106 3 116	30x3 1/2 35x4 1/2	695 1,495	695 1,495	....	....
REPUBLIC	E 6-4x5	Delco	Rafid	Delco	Cone	4 133	36x4 1/2	2,950	3,000	....	....
REO	M 6-3 9-16x5 1/2 ST 4-4 1/2x4 1/2 R 4-4 1/2x4 1/2	Remy Natl Remy	Johnsn Holley Holley	Remy Natl Remy	Disk Disk Disk	3 122 3 112 3 115	34x4 34x4 34x4	1,285 1,000 1,050	1,285 1,000 1,050	....	....
ROSS	... 8-3 x4 1/2	....	....	Own	Disk	3 115	34x4	1,350	1,350	....	....
SAXON	A 4-2 1/2x4 B2 6-2 1/2x4 1/2	A. Kent A. Kent	Mayer ....	.... G & D	Plate Disk	2 96 3 112	28x3 32x3 1/2	395 785	395 785	....	....
SCRIPPS-BOOTH	C 4-2 1/2x4	A. Kent	Zenith	Bljur	Cone	3 110	30x3 1/2	775	....	....	....
SPAULDING	H 4-4 1/2x5 1/2	Simms	Rafid	Ents	Cone	3 130	36x4	1,600	1,600	....	....
S. G. V.	J 4-3 1/2x4	Bosch	Zenith	W. Lnd	Disk	4 118	34x4	2,300	2,300	....	....
SIMPLEX	38 4-4 1/2x6 1/2 50 4-5 1/2x6 1/2	Bosch Bosch	Nwcm Nwcm	Bosch Bosch	Disk Disk	4 137 4 137	37x5 37x5	All bodies to order	All bodies to order	....	....
SINGER	Six 6-4 x5 1/2	Eismn	C R G	Wths	Disk	4 135	36x4 1/2	2,350	2,350	....	....
SPEEDWELL	I 6-4 1/2x5 1/2	Wths	Shblr	Wths	Disk	3 135	37x5	....	....	2,950	....
SPHINX	A-15 4-3x5	Spldf	Mayer	Spldf	Cone	3 112	30x3 1/2	695	695	....	....
STEARNS	L-4 4-3x5 1/2 S-Kat 4-4 1/2x5 1/2 S-K-6 6-4 1/2x5 1/2	Bosch Bosch Bosch	Shblr Stmbg Stmbg	G & D G & D G & D	Disk Disk Disk	3 119 3 127 4 134	34x4 36x4 1/2 37x5	1,750 3,750 4,850	1,750 3,750 5,000	....	....
STUDEBAKER	4-SD 4-3 1/2x5 6-E.C. 6-3 1/2x5	Remy Remy	Shblr Shblr	Wagner Wagner	Cone Cone	3 108 3 121	33x4 34x4	985 1,385	985 1,450	....	....
STUTZ	H.C.S. 4-3x5 Br. Cat 4-4 1/2x5 1/2 Six 6-4 x5 T. Car 4-4 1/2x5 1/2 T. Car 6-4 x5	Remy Bosch Eismn Bosch Eismn	Stmbg Stmbg Stmbg Stmbg Stmbg	Remy Remy Remy Remy Remy	Cone Cone Cone Cone Cone	3 108 3 120 3 120 3 130 3 130	32x4 34x4 1/2 34x4 1/2 34x4 1/2 34x4 1/2	1,475 2,000 2,125 2,375 2,400	1,475 2,000 2,125 2,375 2,400	....	....
TOURNAINE	12 6-4 x5 1/2	Simms	Zenith	Wths	Disk	4 124	34x4 1/2	3,150	3,150	3,250	....
TRUMBULL	15-AB 4-2 1/2x4	Spldf	Brze	W. Lnd	Cone	3 80	28x3	395	395	....	....
TWOMBLY	... 4-3 1/2x4	Spldf	Zephyr	Undec	Cone	3 100	30x3	680	750	....	....
VELIE	4-45 4-4 1/2x5 1/2 6-50 6-3 1/2x5 1/2 Blw1 6-3 1/2x5	Bosch Bosch A. Kent	Stmbg Stmbg Stmbg	G & D G & D G & D	Disk Disk Disk	4 121 4 126 4 134	37x4 1/2 37x4 1/2 34x4	1,750 2,015 1,595	1,750 2,015 1,595	....	....
VIXEN	S.B. 4-2 1/2x4	A. Kent	Zephyr	....	....	106	28x3	395	395	....	....
VULCAN	... 4-3 1/2x5 1/2	Wths	....	Wths	Disk	3 120	32x3 1/2	975	975	....	....
WESTCOTT	O 4-3 1/2x5 U 6-3 1/2x5	Delco Delco	.... ....	Delco Delco	Cone Cone	3 113 3 125	33x4 34x4	1,185 1,585	1,185 1,585	....	....
WHITE	30 4-3x5 1/2 45 4-4 1/2x6 60 6-4 1/2x5 1/2	Bosch Bosch Bosch	Own Own Own	Own Own Own	Plate Plate Plate	4 115 4 123 4 140 1/2	32x4 36x4 1/2 37x5	2,650 2,800 All bodies to order	2,650 2,800 All bodies to order	....	....
WILLIS-KNIGHT	K-19 4-4 x5 1/2	Simms	Zenith	U.S.L.	Cone	4 130	36x4 1/2	2,475	2,475	....	....
WINTON	21 6-4 1/2x5 1/2 21A 6-3 1/2x5	Bosch Bosch	Rafid Rafid	Alr or Elec Alr or Elec	Disk Disk	4 130 4 128	37x5 36x4 1/2	3,250 2,285	3,250 2,285	3,300....	....
WOODS MOBILETTE	3 4-2 1/2x4	Mgnto	....	....	Cone	2 104	28x2 1/2	390	390	....	....

Motor Car Agencies Recently Established

PASSENGER CARS

Place	Car	Dealer
KENTUCKY		
Campbellville	Studebaker	Buchanan-Lyons Co.
Elizabethtown	Studebaker	A. H. Douglas
Flagstaff	Studebaker	Glasgow Motor Car Co.
Hodgesville	Studebaker	D. G. Hays
Lebanon	Studebaker	T. M. Estes
Lexington	Haynes	Commercial Auto Co.
Louisville	Maxwell	Monarch Auto Co.
Louisville	Ohio Electric	Electric Garage Co.
Louisville	Millburn Electric	Electric Garage Co.
Louisville	Allen	Kenton Motors Co.
Louisville	Lewis	Kenton Motors Co.
Louisville	Detroit	Co-operative Motor Car Co.
Munfordsville	Studebaker	C. A. Dawson
Pleasureville	Studebaker	Riner & Wood
Shelbyville	Studebaker	E. R. Wilson
Springfield	Studebaker	McClure & Mays

KANSAS		
Cawker City	Oldsmobile	J. F. Meyer
Great Bend	Moon	Great Bend Hdwe. & Imp. Co.
Hutchinson	Haynes	Painter & Oliphant
Kingman	Studebaker	Grant & Oakes
Kingman	Overland	Grant & Oakes
Larned	Haynes	H. T. Taylor & Son
Liberal	Moon	W. G. Woods
Macksville	Oldsmobile	R. W. Welch
Rexford	Moon	Fred Mascher & Sons
Russell	Chandler	H. A. Fink
Salina	Haynes	C. W. Tibbley
Scranton	Moon	Sappendorf & Co.
Topeka	Chandler	Independence Auto Co.
Topeka	Oldsmobile	Kansas Motor Car Co.
Wichita	Moon	H. W. Schroeder

MASSACHUSETTS		
Boston	Detroit	Reed-Crockett Co.
Boston	Briggs-Detroit	Reed-Crockett Co.
Boston	Crow	A. P. Sackley
Boston	Coey	E. P. Blake
Brockton	Westcott	Marble Auto Co.
Brockton	Buick	White Auto Co.
Concord	Ford	Torrey & Vialle
Haverhill	Paige	Hayden Brown
Haverhill	Studebaker	Ellison Motor Supply Co.
Hyannis	Reo	John J. Hun
Malden	Haynes	Malden Center Garage
Quincy Falls	Oldsmobile	A. H. Vance
New Bedford	Ford	Van Sleet Motor Co.
North Adams	Ford	Hill-Michie Co.
Somerville	Paige	J. W. Elberg
Worcester	Hupmobile	J. W. Grady Co.

MAINE		
Augusta	Oldsmobile	Fifield Bros. Co.
Bangor	Oldsmobile	A. L. Towle
Caribou	Oldsmobile	W. L. Collins
Lake Umbagog	Oldsmobile	A. E. Rosie
Jackson	Oldsmobile	C. R. Blaisdell
Port Fairfield	Chandler	Bishop & Doran
Portland	Studebaker	Studebaker Corp.
Portland	Chandler	Leighton, Durrah & Griffin
Portland	Oldsmobile	D. E. McNamee
Portland	Chandler	H. A. Harris

MICHIGAN		
Adrian	Ford	Johnson & Mitchell
Allegan	Dodge Bros.	W. J. Vosburg
Azalia	Haynes	L. J. Towle
Battle Creek	Haynes	S. B. Knowles
Bellevue	Ford	F. Clark
Charlotte	Ford	Barber Brothers
Charlotte	Overland	Barber Brothers
Grand Rapids	Franklin	Security Auto Sales Co.
Grand Rapids	Saxon	Grand Rapids Saxon Co.
Grand Rapids	Mets.	Metz Garage
Greenville	Dodge	John & M. Christensen
Holland	Studebaker	M. Barnum
Kalamazoo	King	W. O. Harlow
Ionia	Monroe	B. H. Van Vleck
Ionia	Hudson	Eugene Kerstetter
Ionia	Studebaker	Eugene Kerstetter
Ionia	Oldsmobile	Eugene Kerstetter
Ishteping	Overland	E. B. Nelson
Lansburg	Oldsmobile	E. E. Leland
Lebanon	Franklin	N. A. Meyers
Lebanon	Studebaker	N. A. Meyers
Lebanon	Chalmers	N. A. Meyers
Ludington	Haynes	J. H. Connelly
Monroe	Reo	C. A. O'Leary
Mt. Pleasant	Ford	F. H. Johnson
Mt. Pleasant	Ford	O. L. Kiger
Mt. Pleasant	Dodge	Standard Garage
Mt. Pleasant	Paige	Sykes & Dilliey
Orid	Ford	G. F. Smith
Port Huron	Maxwell	Wm. Varkell
Sandusky	Dodge Bros.	Woolman & Ferguson
St. Johns	Marshall	The Moss Garage
St. Johns	Studebaker	The Moss Garage
St. Johns	Ford	G. F. Smith & Son
Sheboygan	Studebaker	Sheboygan Auto Sales Co.

MINNESOTA		
Marshall	Haynes	M. F. Thomas
Minneapolis	Remington	G. L. Moore

MISSOURI		
Green City	Oldsmobile	J. D. Bohrer
Glasgow	Oldsmobile	E. Ballew
Kansas City	Pullman	I. D. McGrew
Kansas City	Cole	Myers-Eberole
Kansas City	Westcott	Kansas City Auburn Auto Co.
Kansas City	Velle	Velle-Thorp Motor Co.
Kansas City	Pullman	I. D. McGrew
King City	Haynes	Leith & Croon
St. Joseph	Chandler	Leslie Motor Car Co.
St. Louis	Kissel	Colonial Motor Car Co.
St. Louis	Millburn	Cartwright Motor Car Co.
St. Louis	Pullman	Ideal Motor Car Co.
St. Louis	Cole	Cole-Arborist Auto Co.
St. Louis	Mets.	Deluxe Automobile Co.
Washington	Moon	C. A. Krumach

MONTANA		
Helena	Oldsmobile	T. C. Power Co.
Missoula	Oldsmobile	Tumilla & Rivier Auto Co.
Sidney	Oldsmobile	J. A. Barrett

NEBRASKA		
Omaha	Paige	Murphy-O'Brien Co.
Palmer	Haynes	John Kruse

NEVADA		
Tonopah	Oldsmobile	H. H. Bacon

NEW HAMPSHIRE		
Conway	Haynes	W. F. Chapman
Wilton	Oldsmobile	F. W. Clark
NEW JERSEY		
Bloomfield	Regal	Central Motor Car Co.
Closter	Regal	Costner & Brown
Elizabeth	Regal	Elizabeth Auto Co.
Red Bank	Kissel	E. von Kattengell
Summit	Oldsmobile	F. A. Wahl
Washington	Regal	Eckle's Garage

NEW MEXICO		
Albuquerque	Glide	F. F. Trotter
Deming	Chandler	Case & McKinley

NEW YORK		
Binghamton	Moon	S. & O. Motor Co.
Bloomburg	Kissel	Clapman & Hagan
Brooklyn	Regal	Woods Garage & Sales Co.
Brusthon	Regal	B. F. Harris
Buffalo	Kissel	B. F. Milson
Buffalo	Saxon	Poppenburg Motor Car Co.
Buffalo	Moon	Hurd-Landschaft Motor Car Co.
Clifton Springs	Franklin	C. L. Bailey

Place	Car	Dealer
Dundee	Haynes	Earnest & Co.
Elmira	Franklin	F. M. Jones
Hurleyville	Haynes	W. J. Prince & Son
Ithaca	Haynes	J. P. Lang Eng. & Garage Co.
Ithaca	Oldsmobile	E. J. Trapp
Kingston	Moon	Stryker & Youmans
Maugstad	Regal	L. A. Dibble
New York	Regal	Mutual Motor Sales Co.
New York	Regal	Webster-Macgowan, Inc.
New York	Regal	Herf-Brooks Diamond-Warren Motor Co.
Potomac	Oldsmobile	G. P. Lyman
Rochester	Moon	W. M. Kipp
Rochester	Oldsmobile	B. C. Laigal
Schenectady	Regal	Mahey & Maloney
Schenectady	Hudson	Stratton-Rose Co.
Schenectady	Oldsmobile	C. C. Kenos
Troy	Hudson	Listman-Stratton Co.
Walden	Regal	J. B. Walker
Watkins	Haynes	Watkins Garage
Waverly	Moon	State Line Motor Co.

NORTH DAKOTA		
Bowbells	Oldsmobile	Heath & Drinkwater
Clio	Haynes	F. G. Covington Auto Co.
Dickinson	Franklin	Dickinson Motor Car Co.
Fargo	Studebaker	King & Dahl

Coming Events

Feb. 22, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Feb. 27, San Francisco, Cal.—Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Feb. 25, New York, N. Y.—S. A. E. Metropolitan Section meeting; report of Research Committee on Kerosene Carbureters. Research Committee report on Non-Electric Continuous-Torque Transmission.

Mar. 3, Albany, N. Y.—Associated Garages of America, general convention.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.

June 9, Galesburg, Ill.—Two-mile track meet.

June 16, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Association.

June 25, Sioux City, Ia.—Track meet.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 20-21, Elgin, Ill.—Road race.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

July 4-5, Tacoma, Wash.—Speedway Races.

THE SHOW CIRCUIT

Feb. 1-6, Scranton, Pa.—Automobile show, Town Hall. H. B. Andrews, manager.

Feb. 2-6, Kalamazoo, Mich.—Show; Armory, Harry B. Parker and John Van Loon, managers.

Feb. 3 to 6, St. Joseph, Mo.—Automobile show, Auditorium. St. Joseph Automobile Show Association.

Feb. 4-6, Marinette, Mich.—Menominee and Marinette dealers; Armory.

Feb. 8-11, Peoria, Ill.—Show, Coliseum.

Feb. 8-13, Salem, Mass.—Essex County Automobile Dealers' Association show, North Street Skating Rink; Clifford O. Shea, manager.

Feb. 8-13, Toledo, O.—Toledo Auto Shows Co., Terminal building; Hugo V. Buelow, manager.

Feb. 8-14, Troy, N. Y.—Troy Automobile Dealers' Association show.

Feb. 8-15, Wilmington, Del.—Show, Hotel Du Pont.

Feb. 9-12, Eau Claire, Wis.—Eau Claire Automobile Dealers' Association show.

Feb. 8-14, Kansas City, Mo.—Automobile show, Convention Hall.

Feb. 9-12, Peoria, Ill.—Peoria Auto & Motor Cycle Dealers' show.

Feb. 10-13, Davenport, Ia.—Show.

Feb. 15, Fort Wayne, Ind.—Fort Wayne Auto Trade Association show.

Feb. 15-20, Tacoma, Wash.—Show; A. L. Sommers, manager.

Feb. 15-20, Grand Rapids, Mich.—Automobile show, Klingman Furniture Exposition Building.

Feb. 15-20, Bridgeport, Conn.—Show; Armory.

Feb. 15-20, Omaha, Neb.—Show, Auditorium, C. G. Powell.

Feb. 16-18, Bloomington, Ill.—Show, Deere building.

Feb. 18-20, Racine, Wis.—Racine Auto Show Association show, Lakeside Auditorium.

Feb. 22-27, New Haven, Conn.—Automobile show, Second Regiment Armory. W. N. Lindsay, manager.

Feb. 22-25, Allentown, Pa.—Show.

Feb. 22-27, Duluth, Minn.—Show.

Feb. 22-27, South Bethlehem, Pa.—Automobile show; Coliseum; J. L. Elliott, manager.

Feb. 23-27, Ft. Dodge, Ia.—Automobile show, Armory.

Feb. 23-27, Syracuse, N. Y.—Automobile show, State Armory, Syracuse Automobile Dealers' Association.

Feb. 24-27, Battle Creek, Mich.—Show, Rathburn & Kraft building; Messrs. Riley and Wattles.

Mar. 1-5, Wilkes-Barre, Pa.—Vehicle Trades Association show.

Mar. 1 to 5, Sioux Falls, So. Dak.—Automobile show, Auditorium.

Mar. 1-6, Utica, N. Y.—Automobile show; Automobile Club of Utica.

Mar. 4-6, Springfield, Mass.—Show, J. H. Graham, manager.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

Mar. 8-13, Indianapolis, Ind.—Annual Spring Opening, Indianapolis Auto Trade Association.

Mar. 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

Mar. 8-13, Canton, O.—Stark County Automobile Show and Electrical Exposition show, Auditorium.

Mar. 8-13, Utica, N. Y.—Utica Automobile Trade Association show.

March 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers Association. J. Clyde Myton, manager.

Mar. 22-27, Bangor, Wis.—Automobile show, Auditorium; A. P. Pierce, manager.

Mar. Benton Harbor, Mich.—Show, St. Joseph and Benton Harbor, St. Joseph Garage.

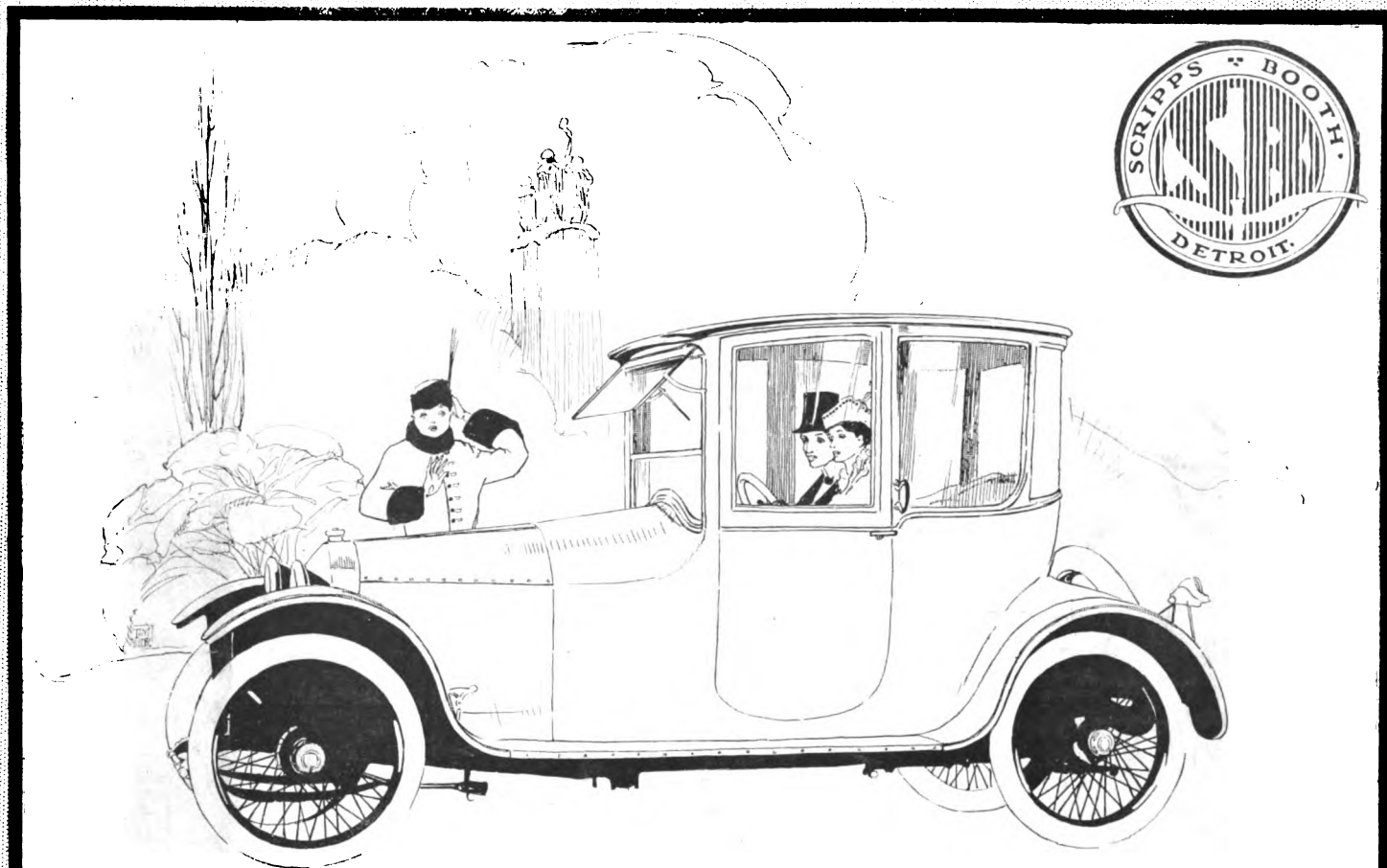
MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 6

New York, February 10, 1915

Ten cents a copy
Two dollars a year



Beauty with Comfort

The Shows have proved the new standard of beauty and luxurious equipment of the new Scripps-Booth cars.

Only a ride can convince you of their higher standard of comfort and personal motoring enjoyment which is the result of the adoption of the most up-to-date comfort principles.

Light weight is only one feature of these cars making for easy riding and handling in the rough places.

Scripps-Booth luxurious light cars are a new criterion of motor car building. Your dealer can convince you.

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MULTIBESTOS

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Follow the White Foot Prints

The distinct superiority of Multibestos has been proved time and again, both by engineering tests and in the every-day service of thousands of car owners.

That it may be distinct in appearance as well as in quality, we mark it with "White Foot Prints."

Not only do the "White Foot Prints" protect the users of Multibestos, but they also afford a great convenience to the dealers who are handling it—for the marks are spaced exactly and can be used for measurement when cutting from stock to fill orders.

So we say to car owner and dealer alike:

Follow the white foot prints,

They lead to satisfaction in brake lining.

Standard Woven Fabric Company

FACTORY, FRAMINGHAM, MASSACHUSETTS

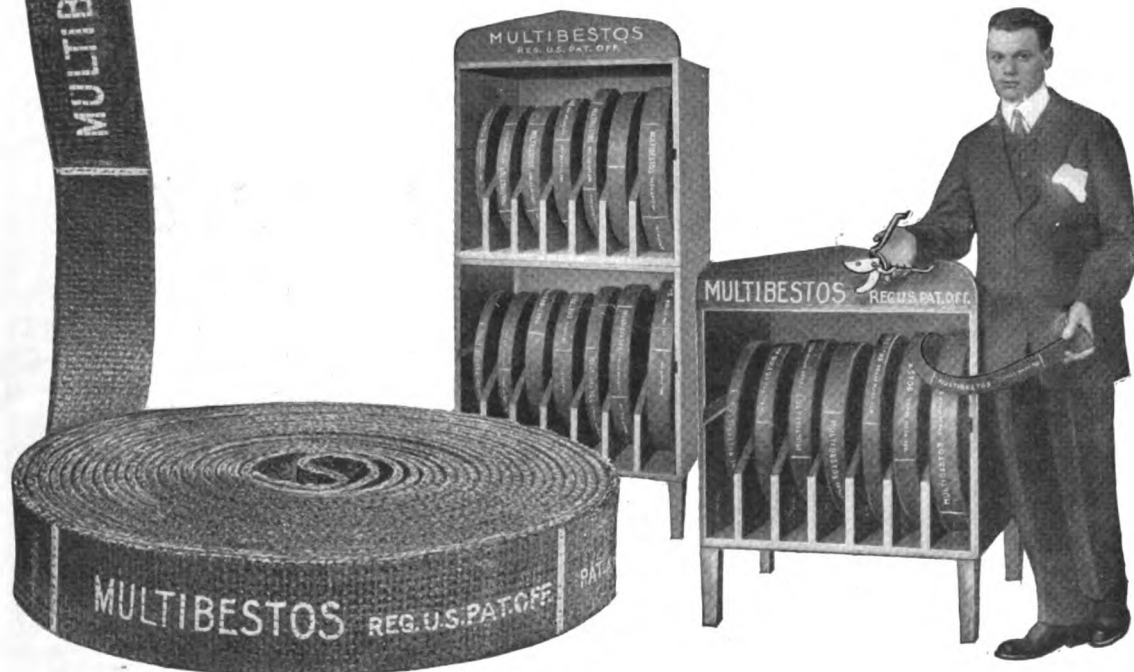
SALES BRANCHES

Boston—F. Shirley Boyd, 903 Boylston Street

Chicago—F. E. Sparks, 1430 Michigan Boulevard

Philadelphia—N. A. Petry Co., Inc., 1427 Vine Street

San Francisco—Fred Ward & Son, Inc., Corner First and Howard Streets



GONE—The DAY of TIRE TROUBLES

No more blowouts—No more punctures—No more rim cuts—No more pumping or changing of tires on the road.

Think what this means in money making possibilities to the wide-awake dealer.

Think what this means to motorists in safety, time, comfort and cost of upkeep.

DAYTON AIRLESS TIRES

are built on scientific principles by skilled engineers as is every other part of your automobile, and possess all the good qualities of pneumatic tires.

These tires are built and have the same appearance as pneumatic casings except that the body is reinforced with additional layers of fabric. The load is carried by resilient rubber piers instead of compressed air, thus eliminating all danger of blowouts, punctures, etc. Spare tires are of course unnecessary.

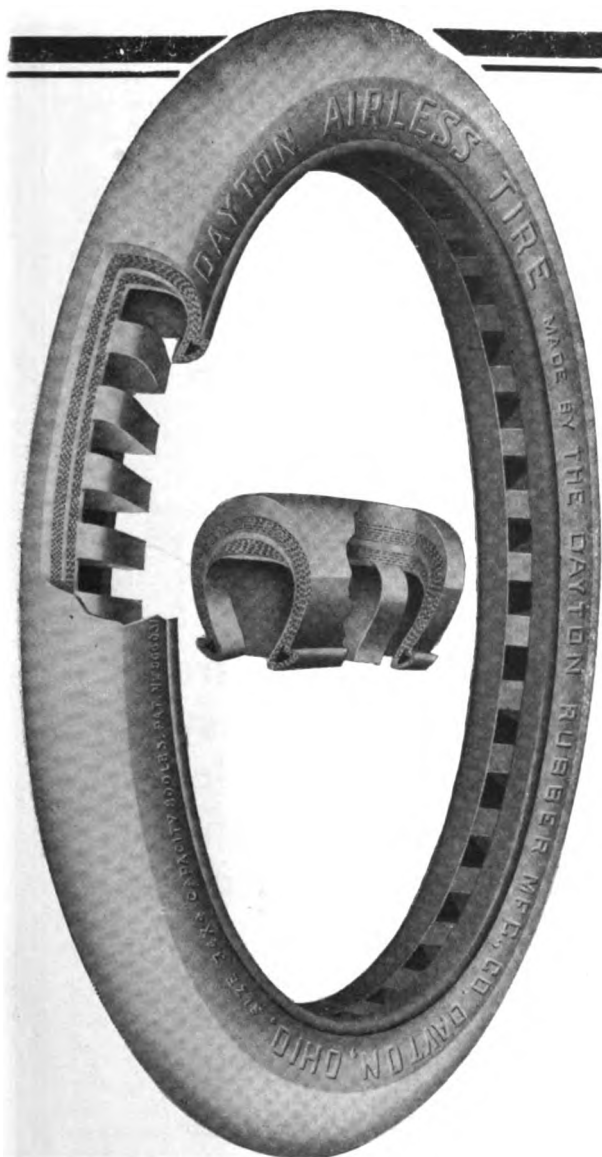
Our guarantee in itself speaks for the DAYTON AIRLESS TIRE.

8,000 miles natural wear on Ford or other light cars.

5,000 miles natural wear on all other cars.

The average mileage, however, far exceeds the guarantee.

Dealers' proposition *very* attractive. Communicate with us at once as we have some exclusive territory open, and a **Big Advertising Campaign** mapped out that will make the Dayton Airless Tire agency a *real asset to your business*.



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Every Gasoline Station Every Garage Owner Every Car Dealer

Should carry Weed Chains in stock because the motoring public demands them.

For safe and successful car operation, there are three absolute necessities:

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If you are not selling this *third necessity* you are missing some real profits, some comparatively easy money that your customers are willing to surrender—because they are coming to realize more and more that Weed Chains are *The Only Positive Safeguard Against Skidding*.

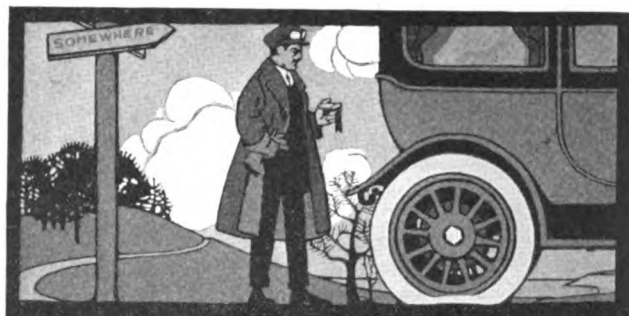
If you are not selling Weed Chains, write us at once. We will put you in touch with a decidedly pleasing profit plan that you should take advantage of *immediately*.

Weed Chain Tire Grip Co.

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Another Puncture!

It always happens at the most maddening time—just when you want to catch a train or keep some important engagement. And usually it isn't really a puncture at all, but a leaky tube.

Now porous rubber (so-called) and leakage around the valves are among the commonest failings of cheap, machine-made tubes. If you are tired of these needless "punctures" equip your car with Kelly-Springfield Tubes. They are made slowly and painstakingly by hand out of real rubber. They can be punctured, of course, but *they won't leak*.

If you use Kelly-Springfield Tubes in Kelly-Springfield hand-made, real rubber tires you will add increased mileage to freedom from needless tube trouble.

Send for "Documents in Evidence" which tells the experience of others

Kelly-Springfield Tire Company

Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.
The Southern Tire & Repair Co., Houston and Beaumont, Texas
Boger-Stiess Rubber Co., 1208 Hennepin Ave., Minneapolis, Minn.
The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.
The Olmsted Co., Inc., Syracuse, N. Y.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.

L. J. Barth, Rochester, N. Y.
Seifert & Baine, Newark, N. J.
Atkinson Tire & Supply Co., Jacksonville, Fla.
Central Rubber & Supply Co., Indianapolis, Ind.
C. D. Franke & Co., Charleston, S. C.
K. & S. Auto Tire Co., Limited, Toronto, Ont.
Todd Rubber Co., New Haven, Conn.
Barnard-Michael Tire Co., Buffalo, N. Y.





More Information For Overland Dealers

Starting with April we shall give you still further sales help.

In that month we start a two page center spread in four colors (one every month) in

The Woman's Home Companion

This also is one of America's foremost women's publications.

It has a circulation of 890,734.

So you see we not only provide our dealers with the very finest cars (which in itself is the greatest sales aid we can give) but we go further—we cooperate by using the most influential and far-reaching advertising mediums in the country.

And by doing so we make the very salable Overland just that much easier to sell.

The Woman's Home Companion campaign is also an addition to our present advertising program.

Handsome catalogue on request. Please address Dept. 50

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, February 10, 1915

No. 6

Tennis-Court Floor Marking Brings 25% Saving in Time

Caring for 3,000 Owners, 100 a Day, Facilitated By Providing
an Exact Location for Every Car

IT has been said that position is everything in life, and the Hudson service station in New York has found from experience that position is everything in the operation of its establishment. Position, in this case, refers to the particular, and exact, location of each individual car undergoing repairs in one particular spot; it must not occupy more than its allotted space; and it must be "lined up" true and fair on lines whitewashed on the floor.

This method, in brief—this mapping out of the service station floor into the rectangles of a tennis-court—has been chiefly responsible for a marked increase in the amount of work that can be done in the available space. It is estimated that a saving of fully 25 per cent is made in the time the average car is on the floor.

Under the old regime, Hudson workmen hovered over each car one-fourth as long again as they do now. Wherefore, the A. Elliott Ranney Co., which operates the station, may be justly proud of its tennis-court service station.

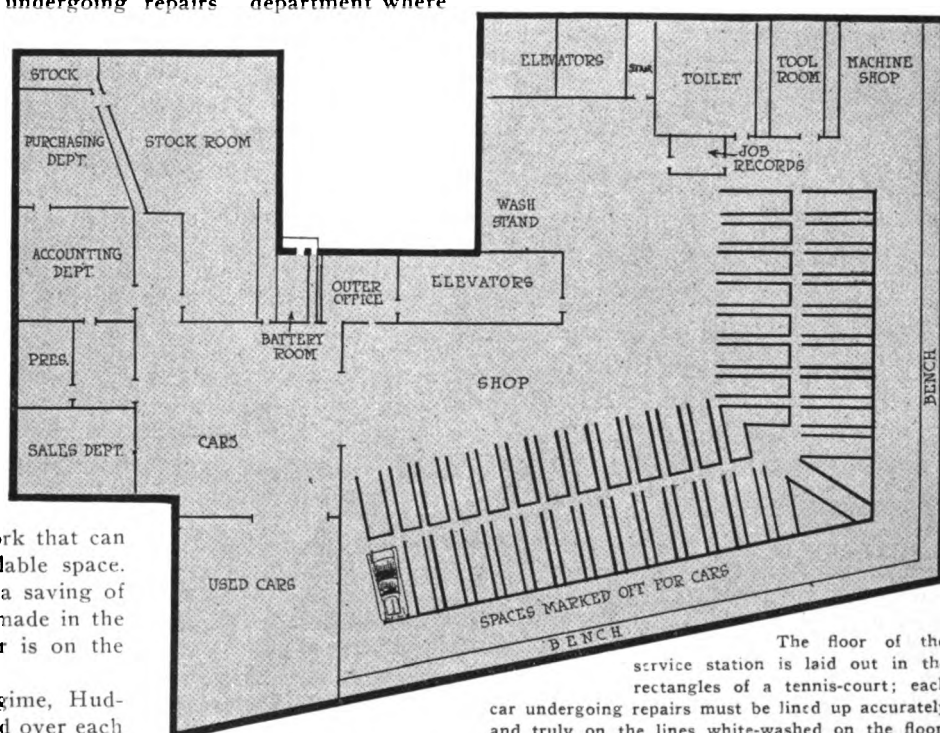
The Hudson station is a large one; it gives service—in the true meaning of the

word—to 3,000 Hudson owners and as many as 100 of them can be cared for in one day. In addition to operating the station during the day, it is also operated all night by way of properly caring for emergency jobs. Also, there is a complete battery charging and repairing department where

precision—and above all, there is a place for everything and everything is kept in its place with scrupulous and assiduous care. Each tool, each part and even each car must fit into it exactly.

Before the present tennis court system of handling cars was put in force, some

attempt was made to arrange cars in a systematic way but this was found to be impossible. An owner would be directed to put his car "over there, right behind that limousine," for example; but instead of placing it directly behind, it might be 6 inches or 1 foot to one side, and might be at an angle instead of being straight. This would result in a large space on one side of the car and a small one, with insufficient room, possibly, for a man to pass on the other.

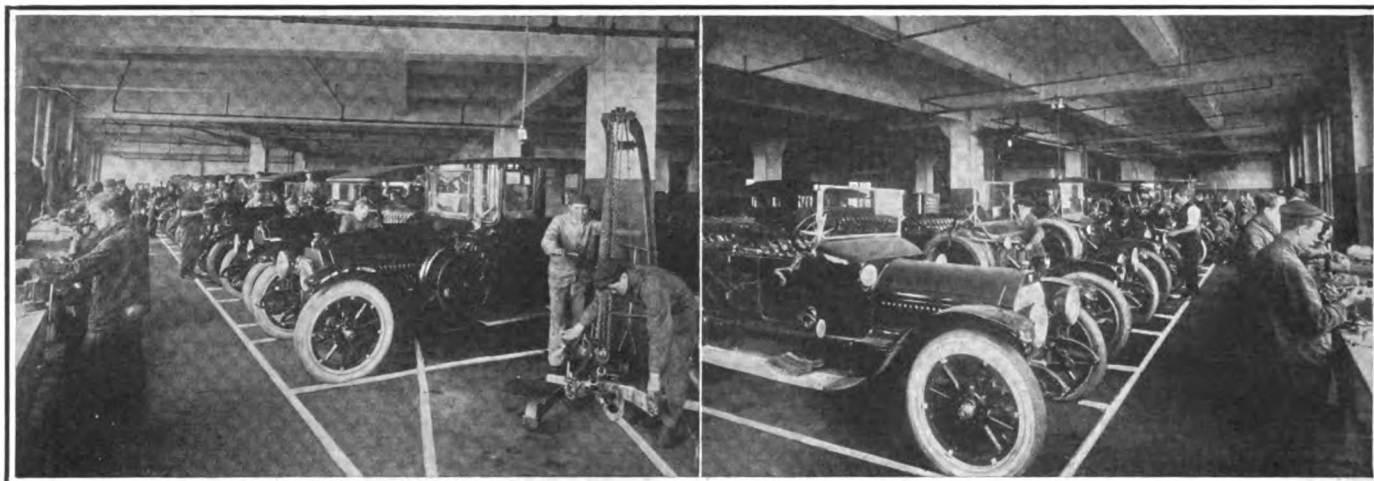


The floor of the service station is laid out in the rectangles of a tennis-court; each car undergoing repairs must be lined up accurately and truly on the lines white-washed on the floor.

batteries are charged, cleaned and repaired.

The principal reason why so many cars can be cared for, and so much work done in the span of the normal day, is that everything moves with clocklike

This meant that time was wasted by the workmen in working on cars in cramped quarters; more time was wasted by workmen in moving about the shop through this disorder and still more time was used in shifting the cars



Corner of repair shop showing orderly arrangement of cars by means of tennis-court lines. The wheels of the cars must rest on these lines and the fronts of the cars cannot extend further than the aisle line, therefore those passing up and down do not interfere with the workmen at the benches

so that there would be room enough around them.

Furthermore, cars were continually being scratched by careless workmen squeezing between them with wrenches and parts, and considerable money was lost in repairing the damage thus wrought.

All this is avoided by the tennis court system. The driver is told to put his car on a certain pair of lines, and he does it with remarkable exactitude. The lines have a fascination for him; it is play to maneuver the car until it is directly on them. There have been no cases where the car was carelessly left 6 inches one side or the other. They are always placed directly on the line every time, and this work is done by the driver, not by the service station workmen.

All Departments Under One Roof

The service station and general offices take up the sixth floor of the building at 1926 Broadway and the free service department occupies half of the fifth floor. The sales room is also situated in this building and thus all departments are under one roof and a minimum of time is wasted in moving from one department to another. Practically one-half of the sixth floor is given over to repair work, and the other half divided up into several departments. The offices are arranged along one side and the remainder of this side is divided roughly into three parts: A used car department, a stock room at the back, and in between a large area for either new or used cars. A court separates the stock room and the repair shop and at its front is the battery room and the elevators.

One is impressed with the order and lack of confusion in the repair department; the cars are arranged in two rows and each car has a definite amount of space because the floor has whitewashed lines on it indicating the exact location. These lines are 3 or 4 inches broad and each pair makes a track for the wheels to run in. There is a 3-foot space be-

tween adjacent cars. Another line paralleling the two walls of the building determines the aisle width or distance that must be maintained between the cars and the walls. These lines are about 7 feet from the walls so that an aisle width of about 5 feet is maintained, allowing 2 feet for the width of the benches along each wall. A similar set of lines indicate the position of the sec-



View looking towards front of stock room; drawers for small parts at left

ond row of cars. The lines are white-washed once a week.

The advantage of this tennis-court system is that no space is wasted. There is sufficient room between cars for two men to work, one man on each car, and yet none is unutilized as would be the case if the cars were placed haphazardly. Also, there is enough room in the aisle for a man to pass down the aisle when one man is at work on the front of a car at the same time another is at the bench directly in front of him.

Overhauling jobs requiring a day or more are placed in the row near the windows; and the smaller repairs, such as grinding valves, adjusting clutches, and even repairing axles and springs, are done in the second row.

The convenience of this may be readily appreciated, for it allows a free movement of the cars—it is rarely necessary to move one car to get another out, and in any case not more than one car must be moved. Several cars with minor troubles may be attended to in a certain space, while the car in the row in front is undergoing more important repairs.

When the work on a machine in the first row nears completion, the space in the second row may be held open until the car has been taken out. However, if a car in the second row must be moved, this causes only momentary embarrassment, because the cars moving in and out of the first row are comparatively few.

Lockers for Motorists' Belongings

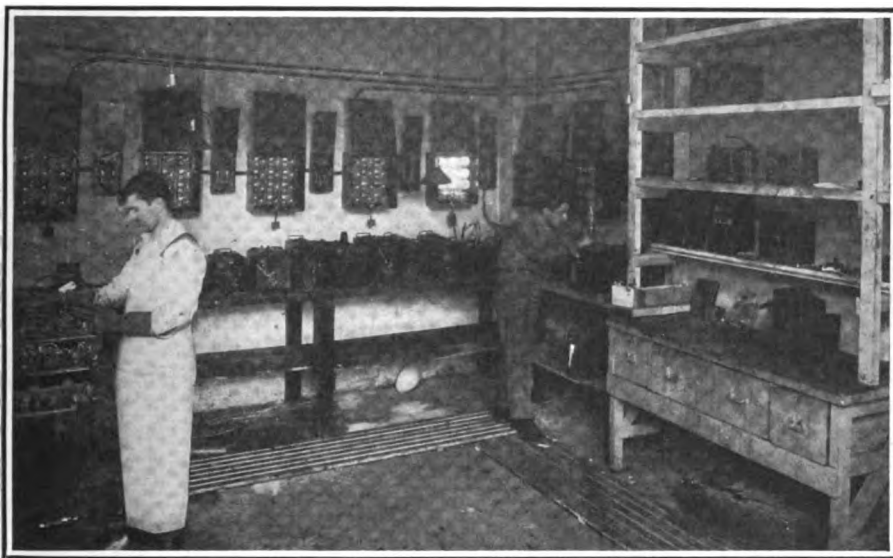
The elevator is situated in the far corner of the shop, making it possible to drive a car into position or out again without backing or the use of skids.

One noteworthy feature is the tool-room, with which is combined a set of lockers for storing equipment taken from the cars undergoing repairs. The tools are arranged along one side and the lockers on the other. Each locker is 4 x 3 x 2 feet and is padlocked. As soon as a car comes in it is stripped of all loose equipment, such as tires, tools and robes, which are stored in a locker until the car is ready to depart.

A motorcycle is kept in the tool-room for hurry calls. It is equipped with a box containing tools and small parts and is ready to give quick service at a moment's notice.

The wash-room is situated next to the elevator along the rear wall and adjacent to it is the tool-room and machine tools.

The main stock room consists of rows of bins 1 foot square, for all parts of ordinary size. Axle and drive shafts are stood vertically on end in a suitable rack; small pieces such as carburetor and magneto parts are housed in large drawers divided into compartments about



Storage battery room showing batteries being charged on bench in rear—switches and lamp bank for varying resistance above. Shelves for storing batteries are at the right

3 inches square; large units, such as tires, axle housings, radiators, seats and flywheels, are kept in a separate room adjacent to the main stock room.

The parts of each car are segregated as much as possible; each car has a definite space and a certain number of bins. A large stock is required because the company supplies all the subdealers in its territory, which includes all of Long Island, Greater New York, the east side of the Hudson to Peekskill and the Connecticut State line, Northern New Jersey up to and including Rockland, Orange, Sullivan and Ulster counties.

Defective Parts Replaced Quickly

Quick action on the replacement of defective parts is obtained by having a factory inspector visit the shop every two weeks. Any parts that have given out are placed in a separate bin and as he inspects them he dictates his opinion as to whether the breakage was due to defective workmanship or material, or misuse by the owner. He also decides whether or not the owner should receive a new part free.

This system has the advantage that it saves time and inconvenience all around. The owner would otherwise be obliged to wait until the part had been shipped to the factory and this would not be until enough defective parts were collected to make it worth while. Also, the latter method would cause a delay at the factory according to how busy the inspectors were. Several months might elapse before the new part was received, but with this new system the delay cannot be more than two weeks.

The supply of parts on hand and what new parts are needed is determined each morning. The stock clerk inspects the bins, notes any that are low, and makes requisitions for new parts, the quantity ordered depending on how fast they are

used up and what reduction can be obtained by ordering in larger quantities.

The rate at which the parts are consumed is recorded by the purchasing department, and when a requisition is received from the stock room the average rate of consumption is determined by referring to the files. Then if the reduction obtained by ordering a large quantity of a certain part is greater than the interest on the money invested during the time it will take to use these parts up, a quantity is ordered. Otherwise, only a few are purchased.

Enough parts are kept on hand to build five complete cars of each model, and in addition any extra parts for which there is a great demand are also in stock.

Every part in the bins is oiled regularly once in two weeks by the night stock boy, preventing

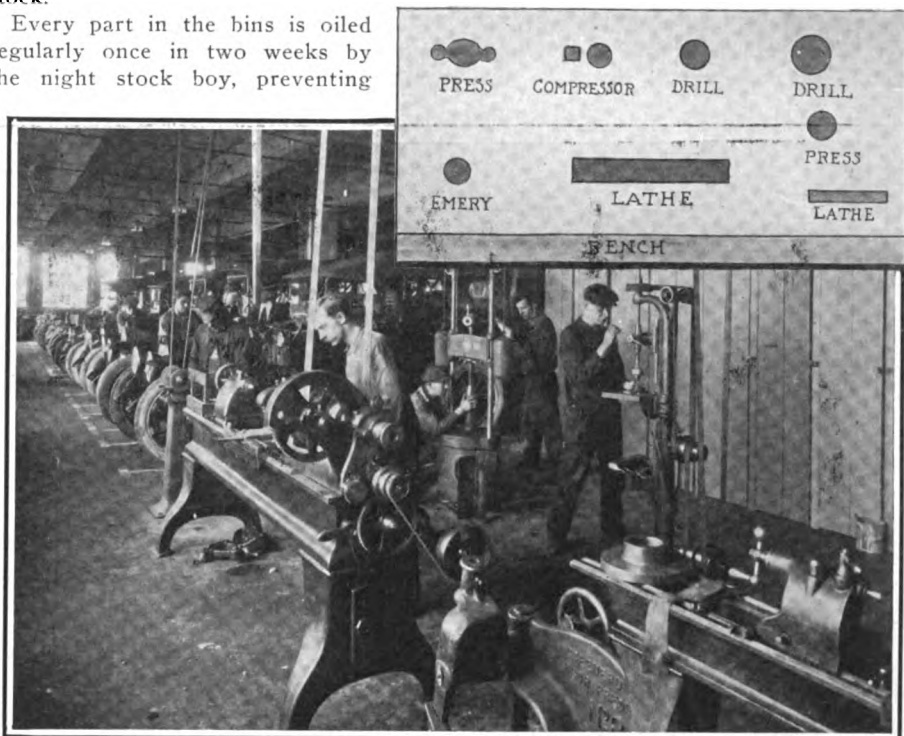
rust and deterioration and keeping the parts in good condition. Before this was done there was a certain amount of loss caused by rusting. No extra expense, outside of the actual cost of the oil, is entailed, because the boy is required to supply parts to the few men on night shift.

Station Operated All Night

The service station is operated all night and a man may be summoned at any hour to effect a roadside repair or to bring in a disabled car. Another advantage is that when an owner desires a car in a hurry and does not want to go without the use of it for a day, it often is possible to run the car in in the evening and if the repairs required are not too extensive the machine may be ready the next morning.

The battery room has no direct connection with the rest of the shop; it is reached through an outside passageway, as required by the fire underwriters. Here complete battery repairs are made and there are facilities for charging 50 to 60 batteries at one time. The charging equipment is simple, consisting of nothing more than several lamp resistances, each with an individual switch and fuse, arranged around the walls within convenient reach.

Along two of the walls are benches with shelves beneath them for storing batteries under charge. Part of the third side is taken up by a series of shelves for storing batteries charged or uncharged, and the fourth side, on which is the window, has the repair workbench. The floor is concrete and there is a boardwalk paralleling the four walls



View of machine tools. The large engine lathe is shown in the foreground. Arrangement of tools is shown in the upper corner

so that acid or water which may be spilled on the floor will not cause discomfort to the workmen.

Direct current at 110 volts is used and each lamp bank consists of twelve 32-candlepower carbon lamps consuming 1 ampere each, arranged in a suitable metal box with a cover to shut in the light. No ammeter or voltmeter is used and the current consumed is determined by the number of lamps in circuit.

The tool equipment comprises an 18-inch engine lathe (Prentiss Bros. Co., Worcester, Mass.). The distance between centers is 4 feet 6 inches and a five-step cone with the usual back gearing provides ten speeds. Small work,

such as refacing valves, is done on a speed lathe, which has a 5-inch swing and a distance of 3 feet 6 inches between centers.

There are two drill presses, one with a bed 2 feet in diameter and another for small work. There are also two presses, an arbor press for light work and a 2½-ton press for heavier work. The small drill press is made by the Francis Reed Co., Worcester, Mass., the larger drill by Mechanics Machine Co., Rockford, Ill., and the larger press by the W. F. & John Barnes Co., Rockford, Ill.

A Gould single-cylinder, water-cooled air compressor, 4½ x 6 inches, supplies air for tires, and two 10-inch emery

wheels on a single arbor complete the equipment.

The offices are arranged along one side and from front to back they are: the salesman's office, president's and vice-president's office, accounting department and purchasing department. The salesman's office is an interesting departure and is designed as a place where the salesman can do his office work without interruption. This scheme allows the salesroom to be given over entirely to the business of selling cars.

No one is allowed to interrupt him, and if anyone calls him on the telephone the message or the number is taken and the salesman calls up later.

New York Dealers Review Year's Work at Annual Meeting

George Stowe Added to Dictorate--Other Directors Reelected

One change was made in the directorate at the fifth annual meeting of the Automobile Dealers Association of New York, which was held Thursday last, February 4, at the association headquarters, Hotel Woodward. George Stowe, general manager of the Chalmers Motor Co. of New York, was elected a member of the board of directors in place of Frank Eveland, of A. G. Spalding & Bros., Stevens-Duryea distributor. The other directors reelected include: M. J. Budlong, Packard Motor Car Co.; C. M. Brown, Winton Motor Car Co.; C. M. Larson, Cutting-Larson Co.; H. L. Stratton, Colt-Stratton Co.; Wm. C. Poertner, Poertner Motor Car Co.; R. H. Johnston, White Co.; John F. Plummer, Locomobile Co. of America; Sidney B. Bow-

man, Sidney B. Bowman Co.; Wm. D. Parkinson, Stutz Motor Car Co.

A meeting of the board of directors is scheduled for Wednesday, February 10, at which officers will be elected for the ensuing year. Following the meeting on Thursday the annual banquet was held at the Cafe Des Beaux Arts. Among those who spoke, Secretary of State Francis M. Hugo discussed briefly the working of his department in Albany.

President Johnston was the principal speaker and he reviewed at length the activities of the organization during the year gone by. Among other things he drew attention to the fact that during 1914 no legislation hostile to the automobile interests had been put through in Albany. He also reviewed the at-

tempt made by the commissioner of licenses to compel dealers in used cars to obtain junk licenses, and told how the matter was taken into court and a decision favorable to the dealers obtained. In the same way, the unwelcome attention of the Street Cleaning Department to motor cars left unattended in certain streets was commented on, and it was brought out that this matter, too, had been satisfactorily disposed of through the efforts of the association.

The work upon which the association the 50-foot rule, which would prohibit the operation of a garage within 50 feet of a theater, school or other place of public assemblage. President Johnston also outlined briefly the work which the association has in hand.



At the banquet following the annual meeting of the Automobile Dealers' Association of New York were the following: 1, Milton J. Budlong, Packard Motor Car Co.; 2, Harry L. Stratton, Colt-Stratton Co.; 3, John F. Plummer, Locomobile Co. of America; 4, Alfred Reeves, National Automobile Chamber of Commerce; 5, Charles Abbott, White Co.; 6, Frank Eveland, A. G. Spalding & Bros.; 7, Francis M. Hugo, Secretary of State; 8, R. H. Johnston, White Co.; 9, C. P. Skinner, Mitchell Motor Car Co.; 10, E. Lascaris, De Dion-Bouton Co.; 11, Charles T. Terry, counsel for Automobile Dealers' Association; 12, A. Roy Camp, Chalmers Motor Co.; 13, C. M. Brown, Winton Motor Car Co.; 14, Arthur M. Day, ex-president, Automobile Dealers' Association; 15, Wm. C. Poertner, Poertner Motor Car Co.; 16, A. Arthur Lesser, F. B. Stearns Co.; 17, Wm. Parkinson, Stutz Motor Car Co.; 18, George McCutcheon, Poertner Motor Car Co.; 19, Frank Carrie, Marmon New York Co.; 20, C. H. Larson, Cutting-Larson Co.; 21, Chas. E. Reiss, Hupmobile Auto Sales Co.; 22, Ed Korb; 23, C. A. Stewart, general manager, Automobile Dealers' Association

**CHALFANT'S
PLATFORM**

Sounder Business
Methods
Get a Full Profit
Account Your Business
Watch Overhead
Cut-Throat Methods
Fail



E. P. Chalfant, secretary of the Electric Automobile Manufacturers' Association, and preacher of the Gospel of Better Business Methods

**CHALFANT
APHORISMS**

"One Price to All"
"Dealers Should Pull
Together"
"Sell the Car on Its
Merits"
"Discuss Used Car
Afterward"

Boosting Business by Evangelism

Chalfant, Preacher of Business Gospel, Is Placing the Electric Car Dealer on a Firmer Foundation

EVANGELISM has been effective in the spiritual world in putting things on a right basis, and when the same object is sought in the business world the right sort of evangelist can do what Billy Sunday and his confreres are doing.

In the dealer field there is a need for this better status of affairs, and—working among electric dealers—E. P. Chalfant has appeared as an Evangelist of the Gospel of Good Business. Nominally he is secretary of the Electric Automobile Manufacturers Association, 910 South Michigan avenue, Chicago, an organization representing 90 per cent of the electric pleasure car business, but in reality he is doing a work of broad scope, which is putting dollars in the pockets of the electric dealers of the whole country.

Need of Better Business

His work is backed by the electric manufacturers—and for this reason: There was felt a need of sounder business methods in the industry from top to bottom. The association, which has been in existence four years, really awakened last October, adopted a few principles of better business for its own members, passed them along to the branch houses and then dispatched Chalfant to drill the dealers who are on the firing line.

He opened his work in Chicago and has continued it in 22 of the principal

cities in which electrics are sold. He called the dealers together, made them acquainted with each other, told them what they had been doing wrong and how they should do right. Showed them where profits come from and where losses go, pointed out fallacies as to accounting, disclosed the way to greater profits, and left the trade in each city on the way to that plane of better business to which the association hopes to bring the whole electric car industry.

Helpful Selling Suggestions

He not only asked them not to employ cut-throat methods, but gave them lists of selling points which will help increase sales, cited numerous points as to why price-cutting eats the heart of the dealer himself and explained sales fields which are little touched but which may yield a bountiful harvest. This harvest will make money for the dealer—and if the dealers make money the whole electric trade from top to bottom must prosper. It is a very logical method whereby the makers aim to help themselves. To do so they must help their dealers.

Chalfant is allied with the electric car trade. It pays his salary. But in several cities where he has preached his Gospel of Good Business and converted the electric dealers, the gasoline car dealers' associations have sent him urgent messages to come back and talk to them—and he is doing it.

Some of the texts of his sermons are given above.

These are the cities he has visited: New York, Brooklyn, Hartford, New Haven, Philadelphia, Pittsburgh, Rochester, Buffalo, Cleveland, Columbus, Cincinnati, Louisville, Indianapolis, Detroit, St. Louis, Kansas City, Omaha, Des Moines, St. Paul, Minneapolis, Milwaukee and Chicago.

Beginning Thursday, February 4, he commenced a trip which will take him to the following cities, Chicago being reached March 14: Omaha, Lincoln, Denver, Salt Lake City, Spokane, Seattle, Portland, Sacramento, San Francisco, Fresno, Cal.; Los Angeles, San Diego, El Paso, Dallas, San Antonio, Houston, New Orleans, Memphis, Chicago.

Sells Himself to Dealers

When Chalfant enters a city he first, as he expresses it, "sells himself to the dealers." He visits each one individually and talks with him, explaining his mission and asking for cooperation. Next, as he says, "he sells the dealers to each other." He calls a meeting and preaches his Gospel of Good Business.

Each dealer is asked if he will not adopt certain policies in his business dealings. He is shown where they will help himself and the whole trade in his city; each one is asked to write Chalfant a letter, setting forth the policies he plans to follow "until further notice." These policies are based upon ONE

PRICE TO ALL as regards selling new cars at their published prices, accepting old cars, both electric and gasoline, in trade at their actual resale value, and making a full and legitimate profit upon each transaction.

Central Market Report Used

A point worthy of note is that in fixing the values for used cars in cases where the dealer has not a better basis the Central Used Car Market Report of the Chicago Automobile Trade Association is employed; the value of this work is recognized and this recommendation is but one step in the Chicago organization's effort to make its work national.

The policy standardizes service and eliminates the losses due to too great service and irregular trading. A wise figure on the selling of demonstrating cars is fixed, and the dealer is given information on general methods which go far toward standardization and putting his business on a profit-making basis. It corrects the destructive practice of selling new cars for less than their worth, and buying old cars for more than their worth.

"Knocking"—the saying of disparaging things about competing cars and dealers—is recognized as a disastrous practice in all business, and to eradicate this evil the dealers are asked to subscribe to a policy which is substantially as follows:

Electric Salesman's Creed

The elimination of all derogatory remarks concerning any make of electric car, its dealers, or its manufacturers; reference to accidents that have happened or may happen or any unfriendly criticisms tending to discredit any particular car or the industry as a whole.

Intelligent comparison is not avoided, and the extolling of individuality and personal manufacturing merit is encouraged. Interference with, or the attempted cancellation of the bona fide sales of competitors is absolutely prohibited.

One of the ways in which business fallacies are exploded is illustrated in Chalfant's figures in support of his statement that subtracting the cost from the selling price does not give the true profit. He states that it seldom costs a dealer less than 15 per cent to do business, and in a theoretical case uses 12½ per cent as an overhead figure. His table, using a five-sale transaction, is given herewith.

With this concrete example—which perhaps fits some dealers's case almost exactly—the point is driven home with emphasis. It is one of the best methods of showing the necessity for proper accounting. Chalfant advises when a profit

COST FROM SELLING PRICE DOES NOT GIVE TRUE PROFIT

Overhead, 12½ per cent.		Dealer's commission, 25 per cent.	
	Cost	Selling Price	Commission
Sale 1.....	\$2,100	\$2,800	\$700
Sale 2.....	2,100	2,500	400
Sale 3.....	2,100	2,300	200
Sale 4.....	2,100	2,200	100
Sale 5.....	2,100	2,150	50
Total cost....\$10,500		Total selling price, \$11,950	Total commission, \$1,450
		Gross profit should properly be.....	\$3,500
		Overhead takes one-half of legitimate gross profit.....	\$1,750
		Table shows a false profit of.....	\$1,450
		But a real deficit of.....	\$300

of, say, \$600 is made, that \$300 be credited to sales and \$300 to service and maintenance and that all items be properly charged to these two accounts. This, he states, is an equitable basis and at the end of the fiscal year will show the profit or loss for each of these departments.

The emissary's labors are to a great extent educational; there is no attempt to jam anything down anyone's throat. The wise course is indicated and the rest is up to the dealer, who, in practically every case, is glad and anxious to profit thereby.

Fields That Are Neglected

Chalfant states there are several fields which have been neglected by the electric car dealers but which may be cultivated with profit; some of them are:

1—Business and professional men who use a car only to run from the house to the office; the big gasoline car should be left for the use of the family.

2—As a shopping car for women; no chauffeur is required and the car is easily manipulated by a woman.

3—For invalids or elderly persons who are in the care of a nurse or companion; nurses can be easily trained to handle the car and the invalid has a feeling of safety.

There are and will be other fields presented for the consideration of dealers. This presentation of suggestions is one of the most valuable phases of the association's educational propaganda.

Chalfant states that he has found the electric car men surprisingly good so far as business practices are concerned, but in need of assistance in many directions; one reason for their comparative high standing is that most of them were business men before entering this work and are not graduated from mechanical work as is the case with many gasoline car dealers, who therefore have had no opportunity for business training.

The electric men also deal with a

high class of trade and constantly mingle with the best class of people in each community. Chalfant states that they are in reality dealers in limousines.

Profit Making Basis

"Our object," said Chalfant, in discussing his work, "is to put the manufacturers, branches and dealers on a profit-making basis. There should be a full profit on every transaction and there should be no long trades and irregular allowances on exchanges. The dealers in a city should pull together like a team and should not be lined up against each other. Too often the prospective purchaser of a car goes from dealer to dealer, makes damaging and often exaggerated or untrue statements, and keeps the whole trade at odds.

"After I leave these cities the dealers generally continue to get together at luncheon once every week or two and discuss conditions and practices. Whereas the customer used to pit the dealers against each other they now discuss the customer and prevent him working harm.

"We advise them as to proper business policies, but there is no penalty attached; we make no man do anything, and he is not required to take any step against his wishes, but by our educational propaganda we hope to show them all that there is urgent need for changes.

Harm in Inflated Lists

"All this results to the benefit of the buyer, too. It assures him the proper service when he buys a car. It also has resulted in the manufacturers putting their list prices on a proper level. With a too high list the dealer might make concessions, and the buyer believed he was getting something for nothing, whereas he was getting no more than when he pays the new and commensurate list, and business is on a better basis throughout.

"One thing we are anxious for the dealers to do is to sell the car on its merits and discuss the price of the used

car afterward. This avoids loss to the dealer, and if universally done will prevent the shopping up and down the row which is so damaging to the dealer.

"Many of these dealers have made me a sort of personal guardian. They advise with me when necessary; some of them make the secretary of the local trade association the arbiter in cases of dispute and all unnecessary hard feelings are eliminated. In some cases the electric dealers have formed associations following my visits, and in some cases they have organized as a division of the local trade association. In other cases they have organized no formal association but meet informally at a restaurant or local automobile clubrooms"

Chalfant was asked why it is that the

Middle West has become more electrical so far as cars are concerned than other sections of the country. He gave what is one of the best answers to this oft-asked question. He said that wide level streets and roads have much to do with it, that the suburbs are nearer the city than in some eastern points, and that the people of that section are not so desirous of chauffeur-driven cars as are others, especially those in New York. Eastern traffic regulations, narrow one-way streets and lack of parking facilities also have their influence. One electric car company, which built a number of electrics with landau bodies and a chauffeur's seat, sold all but two in New York city. Recognizing this condition the electric makers may in the future

do more toward pushing this type of car.

In selecting a secretary the Electric Automobile Manufacturers' Association recognized that it must secure a man who knew the motor car industry, that he must not have been allied with any electric maker and therefore be neutral. Chalfant has spent the last two and a half years in Wall street, during which period he was president of the Springfield (Mo.) Railroad & Light Co. Prior to that time he was sales manager of the Waltham Mfg. Co., which made the Orient buckboard; general manager of the old A. L. A. M.; general sales manager of the Packard Motor Car Co., and president of the E. R. Thomas Motor Car Co.

Annual Three-Day Cadillac Convention Draws 150 Dealers

Business Optimism Prevails—Record Sales Predicted

More than 150 Cadillac dealers attended the annual 3-day convention of the Cadillac Motor Car Co., which was brought to a close at the Hotel Ponchartrain February 5. E. C. Howard, sales manager, presided, and President Henry M. Leland and General Manager Wilfred C. Leland made addresses of welcome, the tenor of which denoted that the Cadillac company is most optimistic as to the business outlook and does not regret having inaugurated and started a new era in the history of the American automobile industry through the introduction of the first American eight-cylinder passenger motor car. During the three days matters relating to the welfare of the business from every angle were discussed between the dealers and chiefs of the various departments of the Cadillac company.

Following is a list of dealers who attended:

W. G. Austin, Frank Anderson, Charles Abbott,
L. C. Bolles, H. H. Brown, G. E. Blakeslee, Ira S. Barnett, John R. Bates, E. V. Bowen, Jr., F. S. Bliven, G. F. Burmeister, John H. Bates, Lee Brenner, Arthur Barry, L. C. Blase, Geo. L. Brown, M. E. Barry,
C. B. Copeland, C. C. Crispin, W. M. Clark, F. B. Cook, F. E. Cushing, W. A. Copeland, E. R. Clark, John E. Crom, T. M. Connell, Jas. R. Cowdrey, F. B. Callender,
O. H. Dietrich, A. L. Danforth, George R. Dana, E. J. Donnelly, J. B. Dickson, J. E. Doane, J. E. De Hart, H. A. Drennen,
E. S. Erdice, Albert Elton, C. A. Englebeck, Thos. B. Emery, Philip Emery, C. H. Erb, O. Eckberg,
C. H. Foster, H. J. Feltham, A. C. Fajman, W. H. Frisbee, P. B. Fellwock, C. E. Fisher, Chas. S. Ferrin, George R. Fulmer, Ernest W. Forstner,
C. F. Gydeson, R. C. Greenlease, S. H. Grossman, A. J. Gilmore, B. E. Grover, C. A. Gower, A. W. Gill, J. A. Goudy, G. H. Grieger,
Lindsey Hopkins, R. R. Hall, H. P. Hannan, I. E. Hanley, Ira E. Holmes, Milton E. Holmes, Matthew Hansen, G. H. Hunsicker, T. K. Hays, M. B. Hughes, M. E. Houser, F. R. Heym, W. H. Horton, L. E. Horton,
T. C. Jones, Randolph Jose, A. B. Johnson, August Jonas, W. Ashby Jones, Jr.

E. O. Kizer, J. P. Kane, L. W. Kibler, Russell Kelly, Chas. B. Kane, W. A. Kelley, F. P. Keyt, D. S. Kruidenier.

H. W. Leavitt, D. F. Larkin, Don Lee, A. R. Leonard, A. C. Lamson, Geo. B. Low, S. S. Lewis.

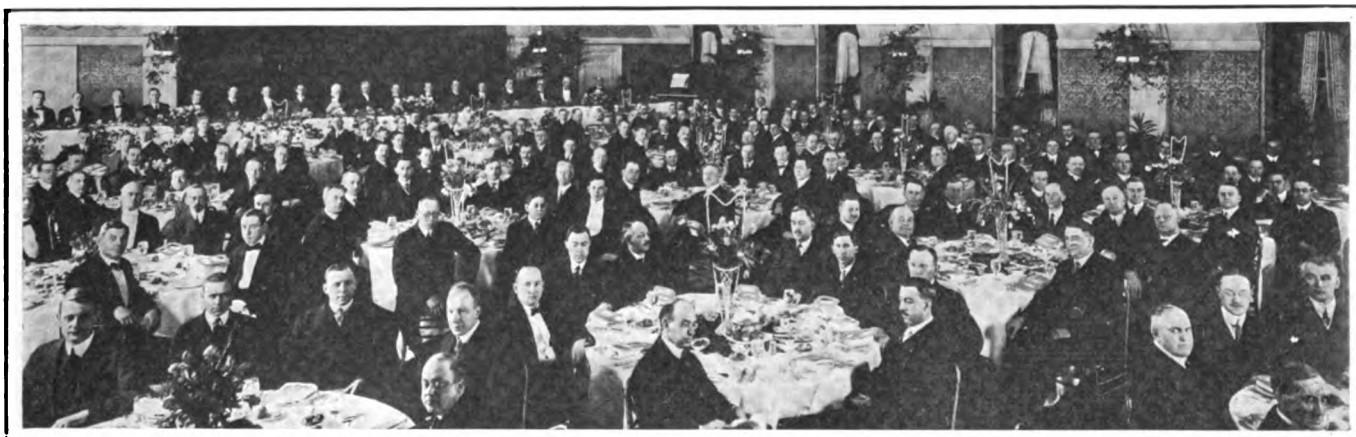
T. L. Martin, H. J. Murch, Wm. B. Mitchell, R. P. McAlister, Fred A. Mahbett, J. A. Muehleisen, Wm. J. McAlister, I. G. McNiece, L. R. Munger, J. F. Morris, C. A. Mitchell, M. E. McCaskey, H. M. McCord, G. H. Miller, J. A. Murphy, G. M. McWilliam, Geo. M. Muehlhauser, C. A. Morris, H. H. Moss, John Monnich, Claude Nolan, George H. Norris, L. W. Nygaard.

E. J. Otis, Wm. E. Potter, G. A. Parks, Jr., John Roth, John W. Robertson, William Reagan, George F. Reim, C. S. Robertson, R. A. Rosenkrans, Jos. Roberts, J. B. Roddey, Gus D. Revol.

G. A. Shroyer, A. C. Swan, E. W. Steinhart, Sam H. Sharman, H. G. Staacke, C. M. Stutzman, T. C. Spangler, J. R. Spaulding, W. F. Stockwell, G. C. Shroyer, S. Stankowitch, Jr., Jos. A. Schulte, Wm. Schram.

Rollin Travis, J. J. Tompkins, S. R. Thomas, R. L. Train, E. H. Torrey, T. H. Towell, P. J. Teel, L. M. Threefoot.

I. M. Uppercue, Chas. A. Vuille, F. H. Van Blarcom, C. O. Wrenn, J. W. Waynick, Sr., A. H. Wilson, C. M. Wyckoff, H. G. Wiley, W. A. Wood, C. M. Wieder, J. B. Wood, D. D. Weltzberger.



BANQUET OF THE CADILLAC SALES ORGANIZATION—Those at the speakers' table are, left to right: L. McNaughton, assistant sales manager; I. M. Uppercu, New York; E. C. Howard, sales manager; Roy Munger, Dallas; Albion L. Danforth, Boston; C. H. Foster, Chicago; W. C. Leland, general manager; C. F. Kettering, Dayton Engineering Laboratories Co.; H. M. Leland, president; Dr. Newell Dwight Hillis; K. P. Drysdale, advertising manager; Theo. F. MacManus; Owen Thomas, consulting engineer; Claude Nolan, Jacksonville; George Blakeslee, Jersey City; Thos. Neal, General Motors; M. J. Murphy, General Motors; G. E. Lawson, Peoples State Bank

WIDE-AWAKE MERCHANDISING

The Average Dealer Is Afraid

So Says a Factory Man Who Ought to Know —
You Must Spend Money for Dealer Organization
But Only A Well-Built Organization Will Win.

"I was in a Missouri city a few days ago calling on one of our dealers," said a well-known factory salesman. "After getting his order I asked him to show me a list of the subdealers he had closed in his territory. He brought out the list. There were only four and yet he had several counties and his own city was quite large enough to absorb the entire energies of his sales force.

"Why don't you get out on the road and line up some more dealers?" I asked

"Don't you know that once you get a nice list of subdealers working for you what they bring will be all velvet?" "Why don't you come down here for a couple of weeks and help me work the territory?" was his reply.

"There you have the average situation. And that is the trouble with the average motor car dealer who is not making money. He bites off a slice of nice territory and then sits down and waits for the factory to help work it. This same

dealer with whom I had this conversation kicked because traveling men on the road cost money. He did not have brains enough to figure that any business worth while costs money to get. There must be some expense attached to it. He had the money but he was afraid to spend it and therefore he was doing only half the business he ought to have done.

"The extra 5 per cent on 50 more cars going into his territory would have shown him a nice profit on any expense he had been put to, and furthermore, he would have the beginnings of a good organization that would make money for years to come, if he sold a car.

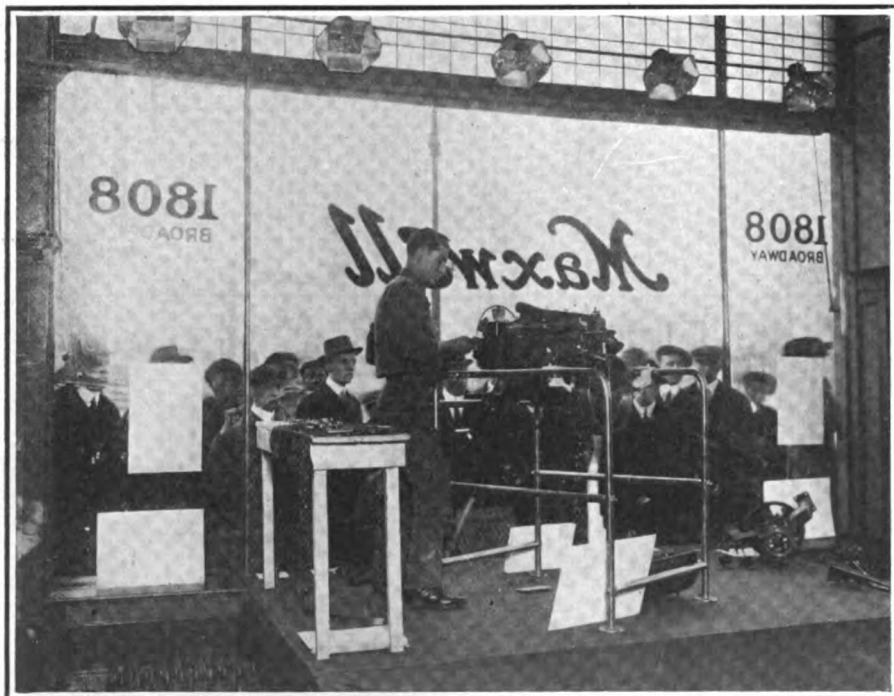
Progressive Dealers Spend Money

"You ask me what is the trouble with the average dealer? My judgment is that the average dealer is afraid. He lacks courage. He does not realize that his big strength is in organization.

"Who are the fellows who are making the big money? In every case almost they are men who have gone ahead and spent money to get an organization and then have spent their time and effort taking care of and fostering that organization. That is the secret of making money in the motor car business. And the dealers must go ahead and line up their own organizations. The factory cannot do it for them.

"So the minute a dealer gets the idea that it is **his** business, his opportunity, and that it is worth an investment of money to capitalize this opportunity, he is on the way to make money."

Motor Building Display Draws Attention



Every hour and one-half this motor is taken apart and reassembled in the window of the Maxwell branch in New York. Harry J. De Bear, in preparing the display, had Stentor-Phones, or loud-speaking telephones, put in so that a lecture delivered from the inside during the work can be heard outside by those who watch the display. The window demonstrates the simplicity of the motor and always drew a crowd.

THINK, THEN DECIDE, BUT DO SOMETHING!

The importance and value of **DECISION** cannot be over estimated. The man who decides should think; weigh and analyze each reason carefully—and then follow quickly with action. Better to act and make a mistake than to vacillate between doing and not doing—and finally do nothing.

HAVE BULLETIN FOR NEWS

Bemb-Robinson Always Have a Bulletin for Customers and Sales Force to Read.

A bulletin board through which you can talk to the public who daily walk by your store is a mighty good thing. For if this bulletin board has interesting messages it will not only be read by the passing public but also by your own customers. And one of the best advertising men who ever lived gained much of his fame by pointing out to the manufacturers of this country the important fact that it is just as vital to keep your present customers "sold" as it is to get new ones. What is a truth for the manufacturers is a truth for the dealers.

The Bemb-Robinson Co., Detroit, realizes this fact. They have signs throughout their showroom. They have signs in their garage. They talk to their own men and to the public by means of Bristol board and the sign writer. They believe in it absolutely.

Always somewhere in the salesroom is an easel bearing a well worded message. Here is a sample. A large sign bearing the following, all painted in letters at least 2½ inches high, appears in the window of the Bemb-Robinson service department. Read it carefully. It is interesting and it is part of a well thought out plan that is forever building public confidence.

INCREASES BUSINESS BY LOW DAY STORAGE

Garageman Stores Cars 12 Hours for 15 Cents and Draws Transient Trade

The Palace Garage, Hartford, Conn., has put into effect a plan during the cold weather whereby it stores cars for 12 hours for 15 cents; the time limit is 11 o'clock at night, after which the cars go on regular storage. This gives owners a chance to attend theatres and receptions and also permits them to take their cars out at noon and come back again on the same storage as long as they are out by 11 P. M.

"Where I used to get 2 or 3 a day," says T. M. Metcalfe, the proprietor, "I am now getting 10 or 12 a day and also get some odd repairs and a few washes and a little gasoline and oil trade. Our capacity is about 150 cars, which gives ample room for transients and regular boarders."

A POLICY THAT IS YOUR GUARANTEE

We sell used cars to pave the way for new car sales, not for profit. We make no padded allowances which compel us to sell at exorbitant prices or take heavy losses. We have no incentive whatever to ask more for any car than it is worth. It means much to have the man who buys a used car from us send his friends here and come again himself when he wants another. Good-will is the only basis on which we can maintain a used car market big enough to absorb the cars that we are called upon to dispose of.

DANGEROUS TO BE A VISITOR

When You Call on a Man Talk Business—Impress on Him That You Value Your Time.

"There is such a thing as cheapening your effort by too frequent calls on your probable customers. Many people ignore altogether the high value of a salesman's time. They keep him waiting and then after he gets in want him to stand around and wait while letters are signed, instructions given to employees, telephone calls made, and a hundred other matters attended to. Especially will they presume in this way on the man who calls often.

Do Business and Get Out!

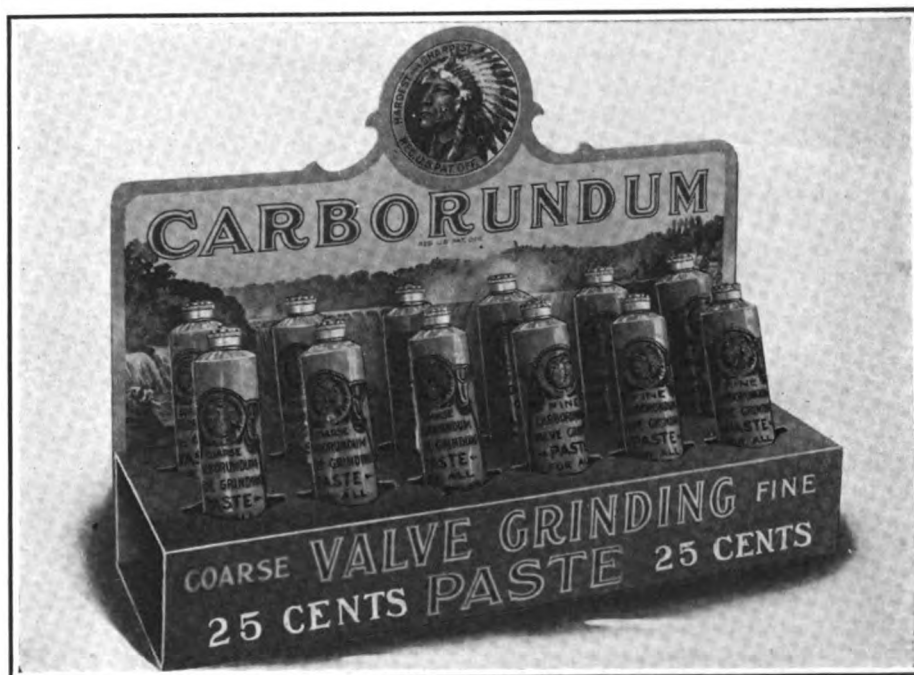
"Try and get people to realize that you set a high value on your time. That you mean business—and would prefer talking business to anything else. It's a dangerous thing to be a visitor. And sooner or later it will land you in trouble. Don't let your possible customers know you too well. It does not pay. Establish confidence and get the order as quickly as you possibly can. And then get out."

Talk Business

When you visit any other city call on the best dealers. Talk business with them. Seek new ideas. Adopt the good ones. Drop any of your own that you find are bad. It is often less costly to learn through the experience of others. Wisdom comes through trained observation.

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. One is illustrated herewith and this will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



The Carborundum Co., Niagara Falls, N. Y., furnishes this display stand to dealers who stock its valve grinding compound. The stand holds one dozen tubes of compound and is attractively lithographed. It will draw attention to the merchandise and assist in making sales.

Minneapolis Show Draws From Mammoth Territory

Annual Show Draws From Area of 316,000 Square Miles

Farmer Wields the Balance of Car Purchasing Power

Time Payments Demanded on Both Cars and Accessories

Minneapolis, Minn., Feb. 6.—When the eighth annual motor show closed here tonight, after running for a week, all exhibitors united in declaring it the best motor show ever held in the Twin Cities. It was the best show because its attendance was 25 per cent above that of any previous show held here. The dealers were present in greater numbers than ever before, in fact, over 4,000 dealers were present from this territory, which includes the states of Minnesota, North Dakota, South Dakota, the east half of Montana and the northwestern counties in Wisconsin.

The Minneapolis show is not a retail show for this city and St. Paul but a great distributing show for the north-west section of the country. The dealers come in to place specifications for shipments of cars to the territory and generally bring with them hundreds of prospects who want to look over all the different makes of cars before finally selecting. As a result of the show the Minneapolis distributors have orders on many carload shipments and in addition many retail sales are made, but yet it is not in any sense a retail show, although the Twin City citizens attend in large numbers, the paid attendance alone for the week exceeding 40,000. To this can be added the tens of thousands who get tickets from dealers, which brings the attendance figures well up. Twin City dealers of small cars selling under \$1,000 do not expect to make many retail sales, but do get names of many prospects.

Many New Agencies Placed

Minneapolis distributors placed many new agencies during the week, particularly those handling new cars. Thus W. E. Wheeler, of the Northwestern Automobile Co., handling Saxon and Chandler, arranged for forty or more agencies in the territory. Milton Brice, of Brice Automobile Co., selling the Grant, appointed 50 to 60 new dealers. The La Crosse Implement Co. appointed 35 to 40 new Dort agencies. The Pathfinder Motor Co., which is extending itself in this territory, appointed 10 new dealers. These examples are typical of the value of the show for cars that are relatively new, whereas old-established

makes add few new agencies during show week.

Although many distributors placed few if any new agencies, yet their dealers from the territory attended in good numbers, so that at least 50 per cent of all dealers were present at the show. Overland has 150 dealers, of whom 120 were in attendance; Studebaker had 225 at its dealers' dinner; of the 65 Paige dealers, 35 were at the show; Mitchell has 110, of whom 35 were here; of the 100 odd Grant dealers, 75 were in the city; Reo has 140 selling agencies in the territory and 90 attended the show; of 250 selling Saxon and Chandler, 125 were here; Franklin has 20 dealers, of whom 10 attended; Pathfinder reported the same figures; and with such leaders as Ford and Buick the representation of agents was particularly high.

Gateway to the Northwest

Motor car show week is the second biggest week of the year for the Twin Cities, the fall-fair week bringing greater crowds to the city, but the money spent in show week is greater. Minneapolis and St. Paul are the great buying cities for the territories, in fact they are familiarly known as the gateway to the Northwest.

As a motor show the Minneapolis exhibit is one of no mean proportions. The National Guard Armory and annex affords 50,000 square feet of floor space with a narrow gallery for accessories on the sides; and the annex, of slightly greater area, lies to one side and is reached by a short passageway of 50 feet. Here are cars, trucks, tractors, electrics and accessories.

58 Different Makes on View

All told, 58 different makes of gasoline passenger cars were exhibited; five makes of electrics, seven makes of gasoline trucks, three makes of gasoline farm tractors, and 52 accessories. The totals of vehicles exhibited were:

Gasoline passengers cars.....	163
Electric passenger cars.....	13
Gasoline commercial trucks.....	13
Gasoline farm tractors.....	4
Total	193

The display of cars compared favorably with that in New York and Chicago, many of the exhibits from these shows being sent bodily to the Twin Cities. The chassis display was heavy, there being 28. Some of the higher-priced makes, such as the Packard, had two, a four and a six. Cadillac, Overland, Jeffery, Chandler, Studebaker, Dodge, Vellie, Maxwell, Hupmobile, Chalmers, Dort and many others, had cut-away chassis, a few of which had constant crowds listening to the demonstrators' talks.

The display of electrics was particularly good—Minneapolis is a good electric center—there being five makes represented, Detroit, Rauch & Lang, Ohio, Milburn and Chicago. All vehicles were closed types excepting the Detroit cabriolet or roadster type, a vehicle well suited for all-year-round use.

Minneapolis and St. Paul, with a combined population of 535,000, are each year becoming a better closed car market, and berlines, sedans and coupes are coming into their own, slowly but surely. For a closed-car center few of the makers have given the distributors here the assistance they deserved, as the number of closed cars shown is lamentably small. In the gasoline field they totaled 11, made up of four berlines, four sedans and three coupes.

Berline Types Are Preferred

In contrast with these figures were 34 roadsters and 118 touring cars. The limousine can not be considered, in short, it is not here. The Twin City family prefers the berline with its removable windows or partition between the driver's compartment and the passenger compartment, so that the owner can drive if so inclined.

Locomobile, Winton and Packard showed berlines; Overland, Cadillac, Franklin and Stutz has sedans; and Overland, Cadillac and Scripps-Booth showed coupes.

The local dealer or distributor does not want to buy a berline or sedan from his factory for this show as the selling season is nearly over and he would have to carry it over for the fall of 1915; on the other hand, a larger display of closed styles by the makers would serve to ac-

Figures Which Indicate Tremendous Area of the Territory

MINNEAPOLIS DISTRIBUTING CENTER FOR THIS AREA

State	Area, sq. miles	State	Area, sq. miles
Minnesota	84,682	Maine	33,040
South Dakota	77,615	New Hampshire	9,341
North Dakota	70,837	Vermont	9,564
½ Montana	73,000	Massachusetts	8,266
Wisconsin (part)	10,000	Connecticut	4,965
		New York	49,204
		New Jersey	8,224
		Maryland	12,327
		Pennsylvania	45,126
		Ohio	41,040
		Indiana	36,354
		Illinois	56,605
	316,134		314,056

celerate their introduction. Closed cars sell best here from October 1 to December 1, and the orders are generally placed late in the spring and early summer.

Big Field for Closed Cars

There is much talk of local body builders taking up the manufacture of closed types; in other words the trend of special closed bodies is moving westward from New York and Chicago.

All week in spite of the worst snow storm of the season and in spite of temperature close to zero at times, and in spite of more snow than this city is accustomed to, the motor cars were out every day and every night in full force. One night 150 cars were lined up in the open square in front of the armory, notwithstanding a blinding snow storm, and the next night nearly as many were counted under one of the clear, frosty skies for which this territory is renowned.

The great majority were touring cars well fixed up with tops and side curtains; in fact, you do not see a touring car here without top and side curtains up. The hoods are well bundled up with padded jackets and blankets. Looking at these cars and considering the push-ahead spirit of this territory, one is very forcibly impressed with the field here for closed types.

Area is Dominating Note

Minneapolis and geography are always closely associated, just like New York and money, Chicago and stock yards, Washington and senators. Minneapolis is the Flour City of the Union, but in the motor industry the geography aspect of the city crowds out the flour phase. You get into a new range of distance here as compared with New York or Boston. Here area is the dominating note.

The Minneapolis territory, area considered, is almost stupefying. Roughly it embraces more or less of five states: All Minnesota, North Dakota and South Dakota, the east half of Montana and a little northwestern corner of Wisconsin. This area looks big on the map, but it is when you get into figures that you start to comprehend the proportions.

In area this territory is 1/11 of our

country, including Alaska. It totals 316,000 square miles of country. Little New England with its six states, has but 66,424 square miles. You could practically put five such areas into the territory that the Twin City motor car distributor has for his selling zone. No wonder out here they talk "distributor," not dealer.

Area Equals 13 States

But let us get a little more tangible grasp on this Twin City selling territory. This Minneapolis territory is almost equal in area to that of the following 13 states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Pennsylvania, Ohio, Indiana and Illinois. Is there any wonder that out here is a robust spirit, a growing spirit? This great territory is exactly one-half larger in area than either Germany or France. You could lose twenty-eight little Belgiums in it. It is over twice as large as Japan. A few figures are given above:

In the population chart the figures are not so formidable, but they are increasing very fast each year. The population of the whole Minneapolis territory is nearly 4,000,000, as compared with 6,552,681 in New England in 1910. But car buying is not in proportion to population; in other words, the number of cars owned for each 100 population is much higher in Minneapolis territory than in the New England zone.

384,000 Farmers in Territory

When you think of cars out here you think of farmers. They are the great, big, overwhelming, dominating factor out here. They own the territory, and Minneapolis and St. Paul are mere necessary excrescences. Going through the show and talking to exhibitors you get almost caloused to such expressions as, "I sell 75 per cent of my cars to farmers," or, "90 per cent of our sales are with farmers."

This is the farmers' country. There are 384,000 of them in the state of Minnesota, and of these not 10 per cent own cars. One-half the annual output of the country could be sold in this state alone for a year or two. To this you must

FOREIGN COUNTRIES ARE SMALL BY COMPARISON

Country	Area, sq. miles
German Empire	208,780
France	207,054
Belgium	11,373
Japan	147,655
Russia	8,647,657
China	2,169,200

add the two Dakotas and the east half of Montana.

The farmer—let us briefly analyze him. What he has, what he wants and what he is going to be. First, he has more money today than he has ever had before. Wheat is the answer. Minnesota and the two Dakotas have this year produced 280,000,000 bushels of the precious cereal, and the farmer has sold it at an average of 50 cents a bushel ahead of any previous year. This means \$140,000,000 additional going to the farmers in these three states. The state of Minnesota alone has a wheat crop of 90,000,000 bushels, meaning \$45,000,000 additional, more than the farmer looked for.

Plenty of Wheat Money

With this additional wheat money the implement man and the motor car dealer are going to benefit most. They come first. With wheat selling here today at \$1.54 per bushel the farmer is getting \$1.37 per bushel at the grain elevator. On August 1 he was getting 95 cents per bushel and the price has been rising steadily ever since.

No wonder 90 per cent of the cars are owned by farmers. During 1914 the number of cars in Minnesota increased 50 per cent. On November 1, 1914, there were 64,185 cars registered in the state. A year previous there were 42,664 registered.

The "Farmer" of St. Paul in a recent analysis of the motor cars sold in Minnesota last year, says that 63 per cent of the 21,521 cars sold went to people whose post offices are in towns of less than 3,000 population. This is another way of saying that these cars were sold to farmers. In North and South Dakota the same is true, only more so. The farmer is the big buyer. He is the brawn and sinew of the industry in this great distributing zone.

Farmers Buy 63% of Cars

Farmers in this zone are divided into two classes, the grain farmer and the dairy or mixed farmer. The first grows only grain, wheat, oats, etc. He is found in western Minnesota and in the Dakotas. The dairy farmer grows grain, but has many cattle, sheep and swine, and depends on a variety of sources of in-

come. He gets money in each month from the sale of cream; he sells stock and he sells grain. He is found in Wisconsin and generally in eastern Minnesota. He is invading a few of the eastern counties of the Dakotas. His money comes in off and on during the entire year.

Time Payments Necessary

Contrast this farmer with the one who grows grain only, who sells his grain in the fall and gets his money in once a year, and who, if his grain fails, has no other source of income. Place yourself as a dealer selling to such, selling 90 per cent of your output to them. Begin with the basic assumption that you must do business on a credit basis. You must sell for a little cash and take notes at 3, 6, 9 and 12 months for the balance. That is how cars are sold to these farmers. The dealer gets as much cash as he can and takes notes for the balance.

In Minnesota, the notes in the mixed or dairy farming territory are for short periods, 3 or 6 months, and carry interest at 6 or 8 per cent. In the grain farming sections the notes often run for 9 or 12 months and carry 10 per cent interest. The dealer takes these notes to his banker, who gives the dealer their face value in cash. When the notes are due the banker notifies the dealer, who in turn notifies the farmer and makes collection, so that often the farmer does not know the bank has held the note.

Farmers prefer to do this to going to the bank for loans, as often the banks aim to discourage the farmer from buying cars. These farmers have been buying on credit since they settled in the territory and you cannot do business with them at present on any other basis than credit.

Farmers' Cars Need Ample Power

These farmers want touring cars, not roadsters. They all have families, hence, a rational five-passenger car. And they want power. Many roads are heavy and hills steep. As a result, horsepower is a greater selling factor in this territory than in New England, or the East with its improved roads. This explains why several makers of small cars, building only runabouts a year ago, have brought out touring cars, this referring to such as Saxon, Grant, Metz, etc.

In the Dakotas the farmer is buying a two-wheel trailer carrying a box 3 x 8 feet. He attaches this to a crossbar fitted above the rear spring and on this trailer he can carry a load of 1,500 pounds at a speed of 22 miles per hour.

In general the farmer wants a tonneau type, as he can carry his produce to market, bring home his flour, groceries and binder twine; in short, his motor car has entirely replaced his horse vehicle on the road except for taking grain to the elevator.

WHERE MEDIUM-PRICED CARS PREVAIL

Ford	19,399
Buick	5,781
Overland	4,973
Studebaker	3,001
Maxwell	2,260
Reo	1,862
Cadillac	1,577
E. M. F.	1,422
Mitchell	998
Regal	859
Hupmobile	792
Chalmers	783
Hudson	722
Packard	645
Jeffery	592
Velie	590
Jackson	570

These farmers do not take the best care of their cars. Some are not washed from January to December, as in the alkaline sections in South Dakota and Montana the body finish is soon ruined, black suffering quickest.

Credit Problem Has Ramifications

Farmers who buy cars on credit expect to buy accessories, tires, gasoline, and oil, and also get repairs on credit. This is another big dealers' problem.

In the dairy country, with cream checks coming in once a month, the dealer gets his money with reasonable regularity, but in some of the grain sections in the Dakotas, Montana and western Minnesota, there is pay only once a year, and that if crops are good. Often the dealer carries the account for six months and then takes a note for 6 or 9 months with 10 per cent interest. But heroic efforts are being made to get repairs and accessories on a cash basis.

In Montana, F. E. Doran, in Lewistown, a town of 6,000 population, started on a cash basis last August, and now all the dealers in the town have followed suit. He has issued coupon books with \$25 worth of coupons which he sells for \$22.50 or 10 per cent discount. These are sold for cash. The coupons are good as payment for everything except tires and paying for a new car.

In the first month he sold 70 books, and now the farmer is well pleased. Before making the change, Doran had printed posters placarded all through his territory, and he advertised the fact.

Selling Season Opens April 1

Dealers in South Dakota and other parts of Montana are now adopting this new cash scheme. The dealer in the West calculates that it costs 10 per cent to make collections, and the discount of 10 per cent allowed on the coupons is very attractive to the farmer. The coupon books are the same size as a conventional blank check book. The coupons are in \$1, 50-, 25-, 10- and 5-cent denominations.

The selling season in the Minneapolis

zone is largely confined to April 1 to October 1. This is most true with small cars, which may be sold prior to April 1, but with that date or April 15 specified for deliveries. Cars listing at \$1,000 and thereabouts sold better this year in December and January than ever before. The best selling season for high-priced cars ends December 1, as after that date a large percentage of their owners go to California or Florida.

Farmers Run Cars All Winter

Gradually is the motor car being used more all winter here. F. W. Abby, of the Overland agency, says that this winter 75 per cent of their cars are being kept out all winter, and this is a fair criterion of other makes. F. E. Murphy, Mitchell and Paige distributor, while making few closed-car sales, claims that nearly all of these cars in the Twin Cities are running all winter. With him, April, May and June are the big selling months.

W. E. Wheeler, distributor for Chandler and Saxon, estimates that 90 per cent of his cars go to the country, and naturally sales must be congested into a few months. December 1 to April 1 is bad for deliveries. L. H. Fawkes, distributor of Reo, Stutz, Metz and Milburn electric, sells 95 per cent of his Metz cars to farmers—seven touring cars to each roadster. Over 75 per cent of the Chevrolet cars go to farmers, a condition true with Hupmobile, Buick, Dort, Maxwell and many other makes.

Because of its high percentage of sales to farmers, the Minneapolis territory cannot be considered a high-priced one, rather a great medium-price field. This is well emphasized by an analysis of the car registrations in Minnesota, which are given herewith.

Wheat Market Brought Up Sales

While these figures are for Minnesota only, they give a sane estimate of the trend for the entire territory. It is conservatively estimated that 25,000 cars were distributed from this center last year and that nearly 50 per cent gains will be shown for 1915.

The war has not seriously affected this section. August 1, when war was declared, there was a lull which continued for nearly a month, but since then business has been above normal because of the unprecedented condition of the wheat market.

Early in the fall the banks were very tight with dealers, going so far as to endeavor to discourage the farmer buying cars. It had little effect. The farmer knows what he wants. Still, the banker continued to harp on the money spent for cars going out of the state, but forgets that the wheat he sells goes out of the state and the money comes back in. It is a poor law of business or finance that will not work both ways.

Tommy Joins Reilly's Ponce de Leon Society

He Is Afflicted With Selling Senility But Finds the Fountain of Perpetual Selling Youth

By Ray W. Sherman

HANG there! Darn yuh!" Tommy Trumbull slapped his hat on the coat-tree and darkened the early afternoon atmosphere of the office with a threatening scowl. Impetuous he was, to be sure, but seldom out of sorts. Wherefore, Nellie's typewriter stopped rattling for an instant and Reilly turned all the way around in his chair.

Tommy sat down at his desk, pulled out his prospect file, shoved it back again, opened a drawer, shut it again and began fumbling through his notebook.

"My! What a peevish boy!" exclaimed Nellie, and went on with her typing.

"Trouble out on East avenue?" asked Reilly. This was where Tommy spent his evenings.

A Real Grouch

The youthful salesman grunted something unintelligible and deigned no answer.

Reilly whistled softly—and looked at Tommy's back. Tommy had quit fumbling the leaves of the notebook but stared at it intently for want of something else to concentrate on. Reilly had gone through the chorus of "It's a Long Way to Tipperary" and still Tommy didn't move.

"What's the trouble, son?"

"Aw, nothing!"

"Most unusual situation," smiled Reilly. "All this commotion and nothing the trouble! Lost an order?"

"Yes, I guess so," was the meek reply.

"Well, that's nothing to commit hari kari over. Cheer up! Go after 'em again! They've got to come some time!"

"Aw, it isn't that," said Tommy, somewhat mollified. "I haven't sold anything or made any progress toward selling anything in a week. I'm rotten! No good! Can't sell! Can't talk! Car's no good! I don't make any impression! I know it! The prospects know it and—aw what's the use!" He threw up his arms in a gesture of despair and began to walk around the office.

"Take a day off. Take a couple of days—a week—anything. Maybe you're stale," suggested Reilly.

Tommy stopped in his nervous walk and, hands in his pockets, stood and looked out the window. Reilly said nothing.

"I don't know what or why," began Tommy, "but all our arguments about small high-speed motor, cantilever springs, divided front seat, big value for

to do with the business of selling cars?"

"He was the founder of my society of rejuvenation," was Reilly's unsatisfactory reply. "He doped out a cure for selling senility—with my help."

"I thought you'd figure in it some where," said Tommy.

"I merely adapted his idea," answered the dealer. "If you haven't forgotten your history you may remember that de Leon when he discovered Florida was on a hunt for the Fountain of Perpetual Youth, a pool where he might bathe and restore the vigor of former days and remove the snowflakes from his hair."

"Yes, I do remember that."

Interesting Dope

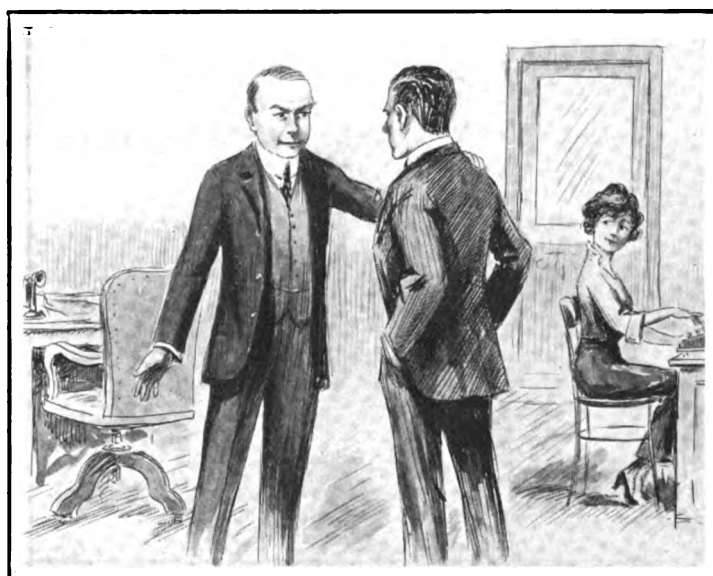
"Well, I have discovered his fountain, but instead of bringing back youth to me it takes the snowflakes out of the hair on my selling arguments; it makes them bright and shining and new; it restores their pristine lustre and makes them the same red-hot shot they were the first day you fired them at a prospect."

"Well, well!" said Tommy, sitting down again.

"This is getting interesting. Let's hear the rest of it."

"Every salesman at some time or other is afflicted with your malady," explained Reilly. "After a man has told the same old sales story over and over again for weeks the story gets stale to him. The arguments are just as effective as ever on a prospect, but the salesman thinks perhaps they are not, and temporarily he loses some of his pep. He wonders if there aren't newer and better arguments for the car he is selling, and when he isn't able to think of them and doesn't seem to be able to dress his story up in a more effective or different way he comes down with selling senility."

"Of course, most of them get over it. It isn't necessarily fatal, but it is well to be provided with a remedy. There are several, but not all of them can be applied by a salesman. One way of avoiding it is employed by factories



Reilly advises Tommy to try the Ponce de Leon system of treatment as a cure for an attack of salesman's senility

the money and all that stuff seems to have lost all their effect. It has got to be such a sing-song tale that I can't put any punch in it any more. I feel when I start to talk to a man that he knows all about what I'm going to say and that he isn't going to take much stock in it. I don't know what does ail me." And he walked around the office again, this time on low gear.

Reilly's face assumed a smiling, kindly expression and he got up, put his hand on Tommy's shoulder and said: "Don't get discouraged. Your case is not serious. It's just a touch of selling senility and you need to join my little Society of Ponce de Leon."

"Selling senility! What's that? Ponce de Leon! I thought he was the old guy who discovered Florida!" he exclaimed. "He was," calmly replied Reilly. "He is that same old boy."

"Well, what in the world has he got

which have their men visit the factory once or twice a year and get enthused anew with the story of the car, how it is made, who makes it and all that stuff. But—take your case—you can't stop to run down to the factory every time you get a touch of the disease, yet it is imperative that you do something to bring back your own good opinion of the car you are selling. It must be put in a new light."

"And so——"

"And so we give the selling story a bath in the Fountain of Youth. Membership in my little Society of Ponce de Leon entitles you to the secret of the location of this fountain."

"Where is it? Where is it?"

Reilly Expounds His Idea

"Right over there." Reilly pointed at the catalog file.

"What, the catalog file?"

"Exactly!"

"S no use!" Tommy threw up his hands. "The bath won't take. If I've read the Sennett catalog once I've read it a million times."

"You're in the wrong fountain," laughed Reilly. "I didn't say to read the Sennett catalog."

"Well, what then?"

"Any of them. All of them—in our class, or out of it."

Tommy leaned forward entreatingly. "Tell me what. Please."

"Just take out a handful of catalogs of cars which come somewhere near the one we sell—in price, specifications and so forth. I've done it many times. You'll find them all marked up on the margins with a pencil. Sit down in the corner with your pipe. Take them home if you want to. Read them over and see the sales story that is presented by the competing cars. You don't need to read the Sennett catalog perhaps; you may know all about it. But get into these others. Look at the pictures, the specifications; read the catalog and all the time bear

in mind what we have to offer in the Sennett.

"Now and then you may notice that some maker is claiming more than he really can offer. When you see those things they will stand out like corns. As you read you will find chances to compare the Sennett very favorably. When you get through you ought to be more firmly than ever convinced of the merits of what we are selling."

"Gee! I'll try it!" Tommy made a dive for the catalog file and came out with a handful. The first one he spotted was the Congress, the Sennett's greatest rival.

"Huh!" He stopped on a page where there was a big black mark on the margin with copious underscoring. "Huh! Small high-speed motor! Economical! Huh! What do you know about that? Our motor is three-eighths of an inch smaller than theirs in bore and if it won't make rings around theirs in revolutions I'll eat the whole Congress car. Gee! I never read this thing before."

"Go on! Look it over," advised Reilly, turning back to his desk.

Tommy Tries the Treatment

Thereafter Tommy turned the leaves and talked to himself. "Rides easy! A darned stoneboat!" There was no need for anyone to answer him. He wasn't talking to anyone in particular. He was just thinking aloud. "My Lord! Listen to that!"

Tommy read and talked and talked and read—then the comments stopped. Tommy had got up and was putting on his coat.

"Where now?" asked Reilly.

"This is too big a job! I'm going up to my room!"

"Good idea," agreed Reilly. "Get where it's quiet and there's no one to bother you. Go into the thing to the bottom and see if you don't find some new enthusiasm."

"I'm getting it now. It sounds like a

good scheme and I want to finish it by myself.

"How did you ever dope that out?" he added.

New Dealer Enters the Field

"I hardly know," said Reilly. "I remember that I used to find great pleasure in looking over models of competing cars. I always seemed to be able to come back to our own with renewed enthusiasm. We have so many good points and the car is such a good buy that it always seemed more so than ever after I had seen what the other dealers were offering. Then one day I got to looking over catalogs—and I found the same result held true. From that I doped out a little plan of making it a regular practice. I do it every time I feel this staleness, this selling senility coming on."

"And here's another thing. The plan works best if you take the bundle of catalogs off by yourself, sit down, make a regular study of them and get the atmosphere. If you pick out one today and another tomorrow the scheme doesn't seem to be so effective. It's the concentration and studious, intensive comparison that seems to count. Just try it. See if it doesn't help you. It may not—but it has helped me out of many a tight hole."

"I'll do that little thing!" Tommy was buttoning his coat. Just then Charley McGrain, the older salesman, came in.

"Well! Where now, little catalog peddler?"

Pep and Ginger Shower

"I'm going to hold a pep and ginger shower!" Tommy was nearly to the door.

"Who's going?"

"Myself and Ponce de Leon." The door shut.

"Ponce de Leon," ruminated Charley. "I've heard of him. New dealer, isn't he? What's he selling?"

"Pep," said Reilly.

"Curbstone" Retailer of Cars One Problem of Western Dealer

Necessity of Freightng Gasoline Overland Often Pushes Price Sky-High

While garagemen in more populous sections of the country are wont to consider 15 and 16 cents a high wholesale price for gasoline, their price is cheap in comparison with that which obtains in Montana and adjoining states, where the wholesale price frequently reaches 40 cents. The retail price is often 50 cents a gallon, according to Clifford Davis, a White territorial man, who has covered miles of that western country.

In Jordan, Mont., he states, it is necessary to freight gasoline overland by wagon from Miles City, a 90-mile haul,

and for this a charge of \$5 a barrel is made. The barrels hold 50 gallons, which adds a carrying charge of 10 cents, and this, added to the not low price in Miles City, makes fuel costly in the inland town.

In this state, he explains, conditions are different from those in the East. Practically all the dealers are garagemen also, and in many cases the car retailing end of the business is not the most important. In Billings, a town of 10,000 population, there are but two men who are dealers exclusively.

As in many other cities a big problem here is the curbstone dealer, the man who handles cars as a side-line, who has no salesroom or other appreciable overhead, is often a "knocker," and who will sell a car at a cut price in order to make a sale. The majority of the dealers recently organized to combat this practice. In describing the territory he covers—which is Montana, Northern Wyoming and North and South Dakota—Davis said it takes 24 hours on the fastest trains to cross Montana territory alone.



Being built at the top of a gentle rise in the road, the Gray-Bellows garage can have two floors though the necessity for an elevator is eliminated. A car is shown on the outside wash-stand

Simple Checking System Prevents Leaks

Careful Arrangement of Equipment Also Plays Important Part— Cash Register Basis of System.

SUCCESS depends upon the energy with which a business—any business—is pushed, the manner in which the push is administered, and the closeness with which results are checked. A good system is essential to any business and there are few businesses, large or small, which will not respond to modern merchandising ideas.

The Gray-Bellows Motor Co., Inc., of Saranac Lake, N. Y., does not operate what would be styled a large garage, nor is it a very small one. It houses about 20 cars and under ordinary conditions, which means when the touring season opens, four, and sometimes six, mechanics are kept busy. But it is not the size of the garage which makes for its success, and that it is successful is well attested by its well-filled interior and the fact that its credit balance well overtops its debit balance at the bank. It is the way the business is run, and the careful check that is kept on possible leaks, that have built the business up and placed it among the most successful in its locality.

E. L. Gray, who with his partner operates the garage, is first and foremost a

business man. In addition to giving considerable of his time to the garage, he also conducts a thriving stationary and sporting goods store. The actual management of the garage is in the hands of his partner, who has been in the automobile business for more than 15 years. Between these two men, the business has been built up from one that was housed—comfortably—in a one-story frame building, to one that requires the present two-story modern concrete structure.

Hill Eliminates Elevator

The building itself is unusual and because of its unusualness it has solved at least one of the problems of the operator of a two-story garage. There is no elevator. The garage proper is built at the top of a rising roadway, with the main entrance directly on the road, which, by the way, is the principal artery of travel, and the entrance to the lower floor reached by a gentle slant.

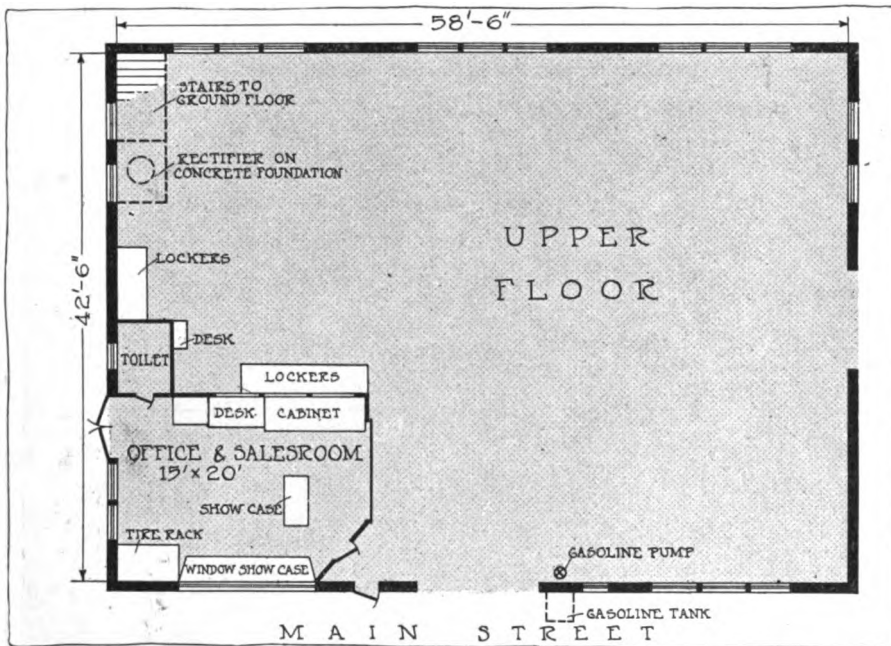
The building is a newly constructed two-story concrete and steel structure, fireproof, having a frontage of 60 feet and a depth of 44 feet. The main floor of the garage is on a level with the

street and has free access to both light and air on the four sides of the building. The ground floor is below the street level and has the same light and air advantages on all sides except the one facing the street, which, of course, is a solid wall of concrete. During the cold weather the building is heated by a steam heating plant, the boiler room being situated in the northeast corner of the building under the ground floor.

In addition to this fireproof building the company owns and uses another building of frame structure a few feet away. This frame building was originally known and operated as Gray's garage, but is now used only for dead storage, and accommodates about 10 cars.

On the ground floor is located the repair-shop and storeroom, with some of the floor space available for the storage of cars. The southwest corner is used for the washing of cars in cold weather, while in the warm weather an out-of-door washstand is used where two cars may be washed at the same time, the platform measuring $17\frac{1}{2} \times 22$ feet.

All the repair machinery is grouped in



The upper floor is devoted to car storage and the charging of electrics and ignition batteries with the office and salesroom in one corner

the northeast corner of this floor and consists of the following: A lathe, manufactured by the Sebastian Lathe Co.; a drill press, manufactured by the Fairbanks Co., New York; a grinder and emery wheel from the Builders' Iron Foundry, Providence, R. I., and a forge. Along the side of the wall for about 24 feet is constructed a work bench containing various tools, such as vises, etc.

In the southeast corner of the building is located the storeroom, where all heavy supplies are kept, such as heavy oils, grease, various hardware accessories and raw material, such as steel for repair work. The stock is protected by a partition of iron lattice such as is generally used for the purpose.

Office and Salesroom Arrangements

On the main floor are located the office and salesroom, the remainder of the floor space being used for the storage of cars, charging of batteries, chauffeurs' lockers, toilet and washroom and the filling of gasoline tanks.

The gasoline tank is directly in front of the building below the street level and has a capacity of 10 barrels. The gasoline is transferred with a Wayne self-measuring pump located at the garage entrance inside the building.

The office and salesroom is located in the southwest corner of the main floor and measures 15 x 20 feet irregularly. The fixtures include a removable window showcase located in front of a large plate glass window facing the street for displaying miscellaneous supplies; a small removable showcase for small supplies for inside displays; a tire rack,

and a large cabinet containing drawers and shelves for all kinds of supplies and accessories. By removing the small showcase sufficient room is made in the office to accommodate one large touring car for show purposes.

Charges Big and Little Batteries

The supplies stocked include Fisk Republic and Marathon tires and tubes; Weed chains; Columbia and Red Seal batteries; Monogram, Wolf's Head, Texaco and Packard oils and miscellaneous greases. The company also is a Prest-O-Lite agency and keeps 16 tanks on hand at all times.

As is the case in many cities other

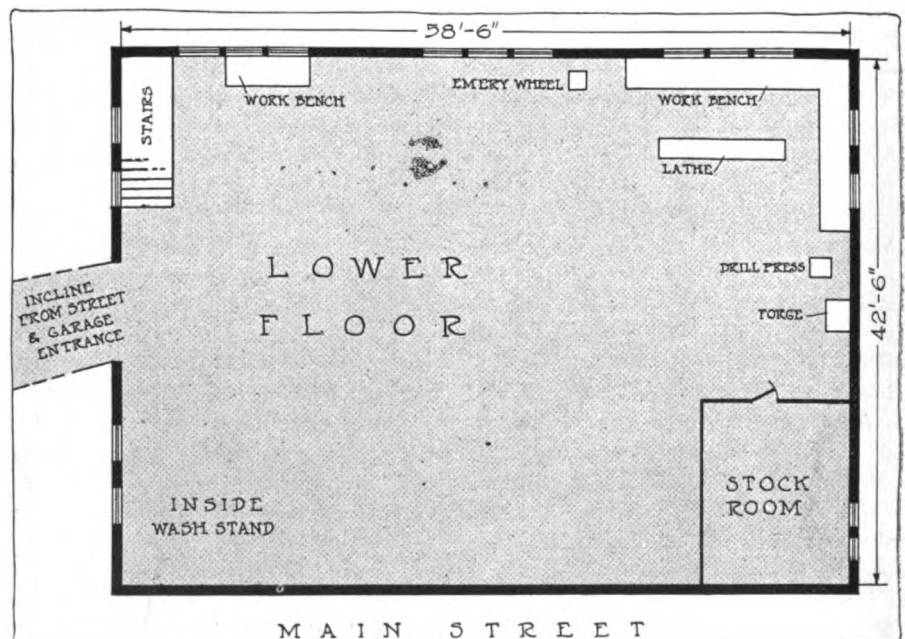
than the really large trade centers, garage charges do not include the care of the car. The following rates are charged, no difference being made because of the size of the car, as each is allotted a certain space: For regular storage, \$10 per month, \$3.50 per week, \$1 per night; for dead storage, \$5 per month. A charge of \$1 is made for washing and 50 cents for polishing.

The charging of batteries is done by a General Electric mercury arc rectifier with a voltage range of 5 to 175. The rectifier will charge at one time two electric cars of the usual 40 cell type. An additional rheostat and low reading ampere meter permits the charging of ignition batteries. The charges are as follows: 75 cents for ignition batteries and 25 cents per cell for large batteries.

Work Done Is Closely Checked

Tires are inflated by a two-tank air compressor which is fastened to the ceiling over the workshop. The tanks are so arranged that they may be used separately or together and carry a pressure of 150 pounds. The machine-shop tools and the air pump compressor are driven by a 5-horsepower motor, electric power being furnished by the local light and power company.

During the busy season from four to six mechanics are kept busy in the repair-shop, the following charges being made per hour: Sixty cents for mechanic, 30 cents for helper, and 75 cents when lathe is being used. Each mechanic is supplied with a workman's time and material card (Fig. 1) every day, on which he is required to give a record of the work done for that day. The card



The lower floor is devoted principally to the machine shop and has a liberal size stock room and a wash-stand for use in cold weather

Daily Statement of National Cash Register			
Use this form to transfer register and transfer to bank			
Date		191	
Remove Amount Placed in Cash Drawer for Change		\$	
Deductions from		Dollars	Cts
Pennies			
Nickels			
Dimes			
Quarters			
Halves			
Silver Dollars			
Currency			
Gold			
Checks			
Total Cash in Drawer			
Cash Paid Out—Add	No. Slips		
Total Cash Taken in Today *			
Rec'd on Acc't—Deduct	No. Slips		
Cash Sales Today			
Refund on Cash Sales—Deduct	No. Slips		
Net Cash Sales Today			
Credit Sales	No. Slips		
Credit Sales Rec'd—Deduct			
Net Credit Sales			
Total Sales Today—Add Net Cash and Net Credit Sales			
Cash Taken in—Shown by Adding Wheels			
Cash Taken in as Above *			
Over Short			
Turn-to-Zero or Lid Counter Wks.		No. of Charge	
No. of Customers		No. of Paid Out	
No. Rec'd on Acc't		No. of No Sale	

Form #16 The National Cash Register Company, Dayton, Ohio

Fig. 5—Form which gives an accurate account of the business transacted through cash register

filed in the office by the workman. All material used is entered on the back of the card.

The system of bookkeeping is rather a simple one. A National cash register is used together with the regular forms. A sales slip, Fig. 2, is made out in duplicate for every purchase, the original being filed in the cash register and the carbon given to the customer. When the purchase is to be charged the purchaser is required to sign the original, showing that he received the goods. Bills are rendered once a month and when paid a slip for that purpose, Fig. 3, is used and filed in the cash register whether the amount paid is in full or on account. Another slip, Fig. 4, is used for all paid out items and this is filed in the same way. At the close of each day, the cash is balanced and all transactions entered in the cash book and a daily statement, Fig. 5, of the cash transactions made out. The various slips, together with the workmen's time and material cards, are then sent to the private office of Mr. Gray, where a regular double entry bookkeeping and self-billing system is used.

[illegible]

Fig. 6—Reverse of the same form showing the totaling columns for quickly summarizing the day's business

gives data as to what work was performed, for whom, time consumed, etc. At the close of each day this card is

Previous to the formation of the present company, Gray had the agency for Hudson and Franklin cars—Hudson since its first models in 1910 and Franklin since 1908. Both agencies were taken over by the new company.

Although much of the business of the garage comes from those who tour through this picturesque part of the country, no great reliance is placed on such "watching, waiting" policy. Instead, the business is actively and continuously pushed through the medium of liberal advertising in the local papers and also in the Automobile Blue Book. At the same time, an accurate card file record is kept of car owners and prospective purchasers in the vicinity and once every two weeks these are sent a form letter which gives information with regard to new models received, used cars on hand, and contains such other announcements as would be of interest.

As a means to stimulate the transient trade, all of the roads leading to the garage are sign posted for a considerable radius.

California to Tax Solid Tires

Senator E. S. Birdsall has introduced a bill in the Senate which would tax motor vehicles fitted with solid tires. The tax would be in addition to the regular horsepower tax and would amount to \$5 for vehicles of less than 4,000 pounds capacity; \$10 for those having from 4,000 to 6,000 pounds capacity, and \$15 for solid tired motor propelled vehicles having a carrying capacity in excess of 6,000 pounds.

1	WORKMAN'S TIME & MATERIAL CARD.
Workman	Date
Job No. Car & Licen. Owner Start Stop Enter kind of work in Hour or descript. this space.	

THE GRAY-BELLOWS MOTOR CO., Inc.

Dealers

SARANAC LAKE, N. Y.

Sales Agency for

Hudson and Franklin Automobiles

Salesman.....191.....

Name.....2.....

Address.....

GASOLINE	
OIL	
SUNDRIES	

Gray-Bellows Motor Company

RECEIVED ON ACC't.

Name.....

Clerk.....Date.....1914

Enter mat

PAID OUT

ITEMS	AMOUNTS
4	

Revised check amount here

By.....Date.....

From, Ltd. The National Cash Register Company, Dayton, Ohio

3

Received the above

Signed.....

Figs. 1 to 4—(1) Workman's time and material card; (2) this slip is made out in duplicate for every sale, the original going to the purchaser and the duplicate being kept for record; (3) this slip is used whenever a purchaser desires a receipt for money paid; (4) this form is used when it is necessary to pay out money from the register

Advanced Maintenance

MAKING MANIFOLDS

By George Fernwell

(Continued from last week.)

The diagrammatic sketch, Fig. 1, is given of pipe bending machines which formed part of the equipment of copper-smiths' shops for bending copper pipes which were too large to be handled by any of the described methods. The small machines on this principle were operated by a screw and lever, while some heavier types were operated by hydraulic power.

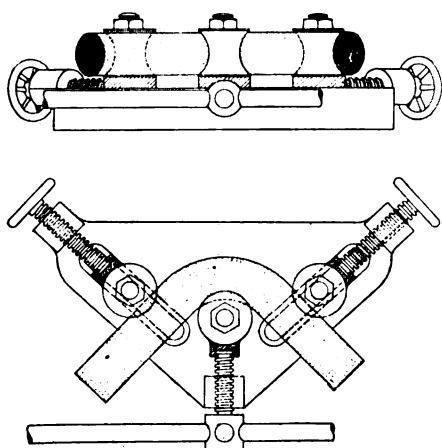


Fig. 1—Diagram of bending apparatus for pipes too large to bend by hand

As may be seen in Fig. 2, two flat steel bars are required, drilled as shown, to provide a practical range of adjustment between the two cast-iron sheaves by simply inserting the bolts at the axes of the sheaves in suitable holes. The bars were made of flat steel 4 inches wide, 12 inches long and $\frac{3}{8}$ inch thick. The sheaves were cast iron boat sheaves. They are inexpensive and can be purchased at dealers in marine or boat hardware. The bending or thrust block A, Fig. 2, was cast of bronze, a number of these being provided, each as required, in which the curve A varied in respect to radius.

Vise Screw Supplies Pressure

The means of applying power was an ordinary largest size machinists' vise. A semi-cylindrical shield temporarily wired to the pipe to be bent served to protect the surface of the pipe at those points from the rough cast-iron surface of the sheave. If the workman desires to spend

sufficient time he can eliminate use of the shields by providing a corresponding cylindrical surface on the sheaves.

Here has been described probably the very simplest form of making effective use of the mechanical principles of the pipe bending machine in Fig. 1. It must rest with the workman and such facilities as he may have how far it may prove advisable for his particular needs to elaborate such a device so as to eliminate the somewhat inconvenient and makeshift use of the bench vise as shown for applying power. One suggestion is to make use of a shaper vise if such is available.

Should Practice on Short Pieces

Space will not permit at present a properly detailed description of how to accomplish pipe bending work in the most efficient and economical manner, when using any of the various types of equipment described. The workman should experiment on short pieces of tubing before attempting such work on long lengths, such as might be required for making a manifold. This more especially applies to the bending device last described. In the latter case the workman had better experiment with bending short lengths of tubing to a particular radius to determine the relation which the distance between the two cast-iron sheaves should bear to the radius of the desired bend.

Making Smooth Bends by Hand

As a general rule it may be stated that in starting the sheaves should be a distance apart from center to center equal to the length of the portion of the pipe required for the bend. Fig. 3 illustrates the method of bending referred to in the last issue, in which a stationary bending block is used together with a bending pin or an equivalent, such as in the hole in the bench, the pin being of small radius, compared with the radius of the desired bend.

The short end of the pipe shown at A, B, C, D and E, Fig. 3, indicates successive positions the partly bent pipe must be placed in at different stages of the work of producing a single bend. On examining Fig. 3 it may be noted that the bend is pressed by the lever

hard against the bending block at F and against the bending pin at H. The different positions, B, C, D and E do not by any means represent immediately successive positions in which the pipe is to be placed. Between the position B and C, for instance, there might be three or four or even more intermediate positions at which the pipe would be held against the bending block and pin and bent just a little.

Frequently during the bending process by this method a sheet metal template, of the required radius, should be applied to the inner curve of the bend to ensure that the pipe is not bent at any portion of its length to a lesser radius than that of the template.

The piece of tubing should be bent very slightly at a number of successive points, after each slight bending effort changing slightly the position of the pipe so that new points on the surface are successively brought in contact with the bending block at F and the bending pin at H. The slighter the change in position depending upon the radius of the desired curve, the more smoothly curved will the completed bend appear.

From the variety of methods and equipments described and illustrated in

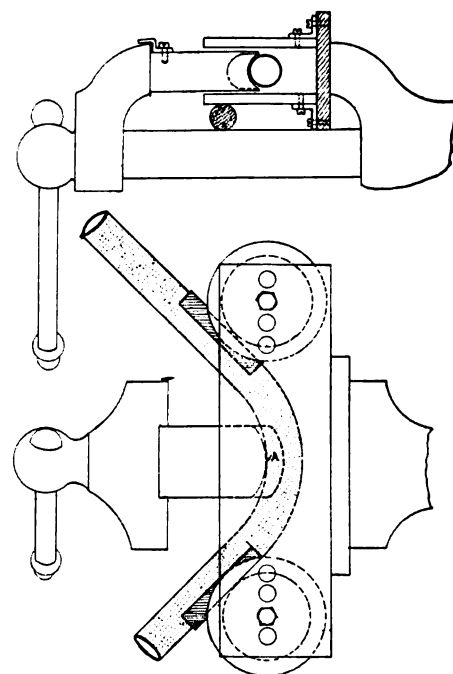


Fig. 2—Method of using vise in applying pressure necessary to bend tubing

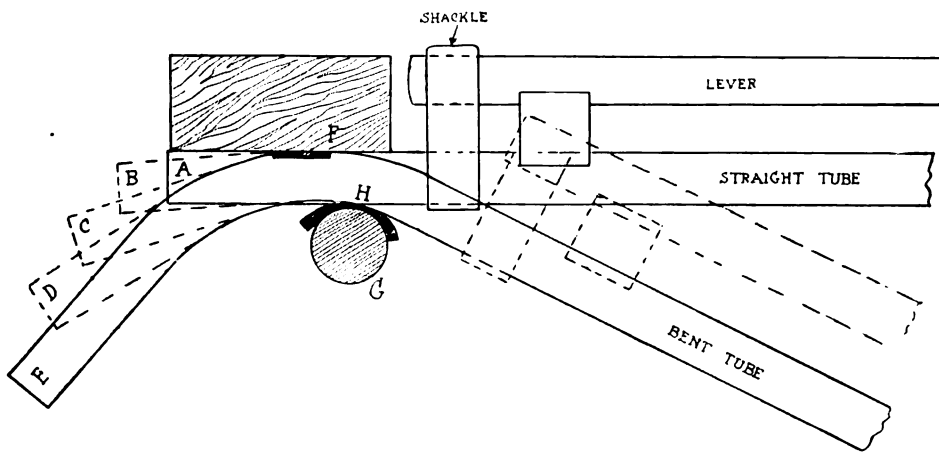


Fig. 3—In bending tubing by hand the curve is made by degrees, the pipe being moved along from one position to another and given a slight bend in each

this discussion of pipe bending, the interested workman should have available an equivalent to the extended experience of the workman skilled in such work from which he can draw for suggestions for handling work in his own particular case.

Main Pipe Must Be Tapered

Water manifolds with a number of branches are usually made in such a manner that the main pipe is gradually tapered along the greater part of its length from the smallest diameter at the waterjacket rear end to its largest diameter where connected to the radiator. The taper of the pipe is so arranged that at each point of the main pipe where a branch is connected an increased area is provided to accommodate the additional volume of water flowing from the branch into the main pipe.

When quantities of manifolds are being made, tubing in quantities can be obtained tapered as required from the tubing mills. In the case of there being only one manifold required, the taper must usually be produced by hand.

A skilled coppersmith can readily make a tapered copper tube by forming it from sheet copper with a seam or joint along its entire length. The seam would be preferably dove-tailed and brazed. This method, however, is beyond the scope of the present discussion.

Tapering Tubing With a Hammer

Another method of tapering a pipe for manifolds is illustrated in Fig. 6. To accomplish it in this manner the thickness of the wall of the tubing should not exceed 16 gauge for the average diameter of manifolds. A lighter gauge would be correspondingly easier to work.

Having obtained tubing of a suitably light gauge and of a diameter corresponding to the larger end of the manifold to be made, the tubing may be cut 4 or 5 inches longer than would be actually required for the length of the completed manifold. The tubing to be tapered should be first thoroughly an-

nealed by heating uniformly to a cherry red and allowing it to cool slowly. Commencing at one end of the tubing, mark a point corresponding to locations of the large end of the required tapered portion of the tube; mark a point a distance away from the first mark corresponding to the required length of taper, providing an additional 2 or 3 inches of length for bending purposes. Select a short steel mandrel which will slip within the tube. Chamfer or round the sharp edges of the mandrel to prevent cutting the inner surface of the copper tubing.

Taper Mandrel Replaced by Bent Bar

With the mandrel in a vise, by the two processes as shown and with a hammer having a face similar to that shown, commence to form a groove in the circumference of the pipe until the outer diameter of the pipe at the bottom of the groove is reduced approximately to that desired at the small end of the manifold. Repeat the process at the larger end of the pipe, but in this case make the groove approximately $\frac{1}{8}$ inch deep only. See Fig. 6.

In reducing the diameter of the tubing at the grooves a series of overlapping blows lightly and quickly delivered should be used, not attempting to make the groove too deep at one blow or at one course of blows.

For the next stage of the process of tapering the tubing it is preferable to have a tool steel mandrel turned to exactly the required taper. On this specially made mandrel the tube may be most conveniently and effectively tapered with a hammer and later the hammer marks smoothed out. A machined steel mandrel, however, is an expense that it is not always desirable to incur in order to make just one manifold.

Although not as convenient or effective a cheaper and quickly obtained substitute for the specially made mandrel may be employed. It consists of a bar of round tool steel of about the same diameter as the inside of the smaller end of the manifold to be made, bent to a slight

angle, just sufficient to permit it to be inserted within the tube and used as an anvil-like surface upon which the hammer blows may impinge.

On the tapering mandrel or its substitute place the copper tubing, and with light, quick, regularly overlapping hammer blows lengthen the groove or work the groove away from the small end towards the large end of the pipe.

The hammer used should have a perfectly smooth face of curved contour and cross sections so that there may be no sharp edges of the hammer face which would in the case of misdirected blows cut the surface of the tubing. The hammer is required only to shape the tubing.

Finishing Pipe With File and Emery

After one course of hammer blows the tubing may be found not to be tapered as much as may be required. If this is the case a second course of hammer blows should be administered, beginning again at the small end. But before recommencing the course of hammering the pipe should again be thoroughly annealed for its entire length. When sufficient taper has been given the pipe, a course of mallet and hammer blows may be given to the tapered portion of the tube with the object of smoothing out the creases formed by the hammer in the tapering process.

The work of smoothing the tapered portion of the tubing will proceed more effectively if the entire length of the tubing is again annealed. The details of using a hammer in the process similar to that of tapering the tubing were gone into with considerable detail in articles on fender repairing in earlier installments of *Advanced Maintenance*. Should the unaccustomed workman find difficulty in making a thorough job of smoothing out the surface of the tapered portion of the tube he may fall back on filing the surface of the tapered tube to remove the pronounced marring of the surface and then remove the file marks with emery cloth, followed by

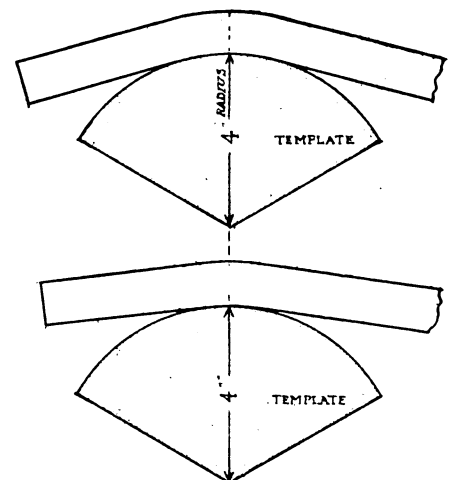


Fig. 4—Frequent application of the template is necessary to good work

grinding on a rag wheel. The pipe when satisfactorily tapered and smoothed may be filled with lead or rosin and bent to the required radius at the smaller end.

Next in order is making and fitting the branches. These are usually made of tubing of the same diameter as the small end of the main pipe of the manifold.

Method of Making Branches

To form the saddle-shaped flange by means of which the curved branches are connected with the main pipe of the manifold, short lengths of tubing may be filled and bent to conform to the radius of the curved portion of the respective branches. The saddle-shaped flanges may then be marked, cut and fitted with a saw and a file, and a small throat-flange made with a light hammer. The flange may be caused to fit the main pipe more closely by annealing and lightly driving the branch with a mallet against the cylindrical surface of the main pipe. This method of forming the branch tubes will not permit of a wide or a thick throat flange at the point A, Fig. 11, because by forming the saddle-flange in this manner the extreme edge of the flange becomes exceedingly thin so as to resemble a knife edge.

With the saddle-shaped flanges of the branches fitted as indicated in Fig. 7.

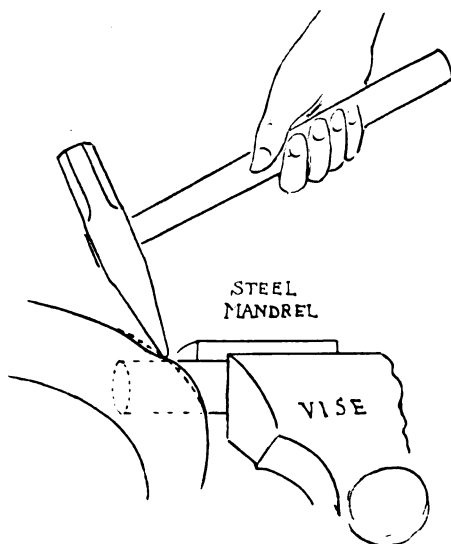


Fig. 5—Commencing the formation of throat flange on short branch pipe

the oval steel flanges may be bored and fitted so as just to slip easily over the extremities of the respective branches.

Care Necessary in Setting for Brazing

When thus fitted the oval steel flanges may be bolted to the A plates of the steel template jig. The branches may be inserted in their respective flanges and the main or tapered pipe where curved inserted in its flange and in the saddle flange of the branches in Fig. 7.

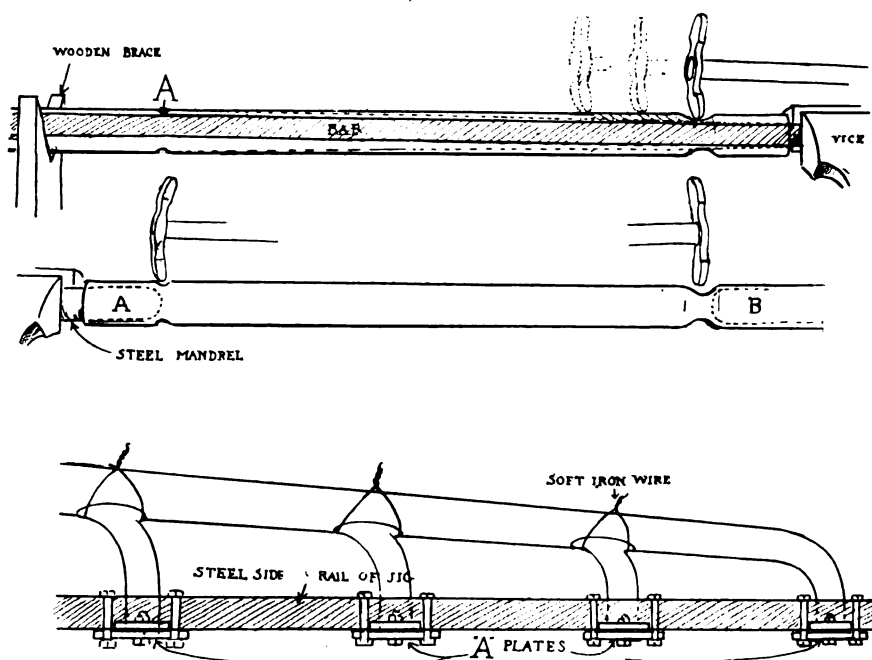


Fig. 6—The upper drawing shows the application of a bent steel bar in commencing the tapering of a tube. The sinking of the grooves by courses of light, quick hammer blows is shown in the second. In the lower drawing the manifold and branches are shown wired in place for brazing on the steel jig

In this position the height of the various branches above their respective flanges can be adjusted to suit the measurements taken of the motor and radiator and wired in that position to the steel flanges so that they will not slip, and also the saddle flanges of the branches may be wired to the main pipe. The way the latter fits the main pipe may be noted and such changes in the fit of the saddle flanges made as may appear necessary.

Cutting Openings in Main Pipe

When the flanges are all fitted to the main pipe of the manifold so that there are no openings or crevices which would not braze perfectly, the branches, the oval flanges and the main pipe may be reassembled in place on the jig, the flanges wired securely in place on the main pipe and the contour of each saddle flange marked with a scriber on the main pipe. Again the pipe must be removed in order to cut openings in the main pipe corresponding with the scribed position or outline of the saddle flanges.

The openings may be drilled and filed to an oval outline or, which is quicker although not leaving as smooth an interior water passage, hacksaw cuts crossing each other may be made in the main pipe. See Fig. 7. The main pipe may now again be reassembled with its branches on the jig ready for brazing in position. Each saddle flange should be rewired to the main pipe and with a very light hammer and a set all openings closed which would prevent perfect brazing.

This can sometimes be done more effectively by applying a blow-pipe to the saddle flange of the branch while

in the reassembled position on the jig; the flange then becoming red hot is soft and more readily responds to light hammer blows without recoiling or springing back as is the case when fitting the flange with the metal cold.

With the saddle flanges fitted so as to lie close to the main pipe everywhere, the joints may be brazed in position clamped to the jig. A condition to avoid in brazing the branches while clamped to the jig is one in which the copper tubing while red hot is caused to bear the weight of the jig. Such a condition would probably result in the pipe being more or less seriously distorted while hot.

After brazing the saddle flanges the oval steel flanges may then be brazed to the extremities of the branches, taking care that the spelter does not overflow and braze the steel flanges solidly to the jig.

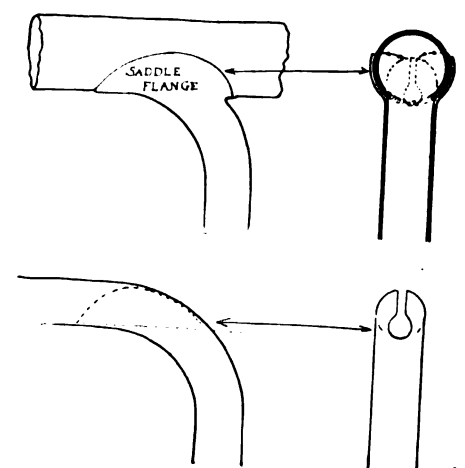
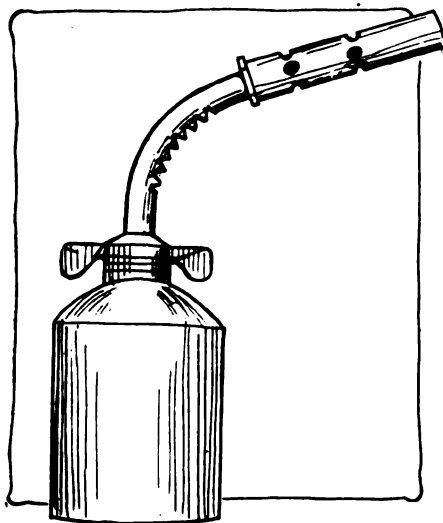


Fig. 7—Detail drawing showing method of producing saddle flanges

RECENT DEVELOPMENTS in ACCESSORIES

Imp Pumpless Gasoline Torch

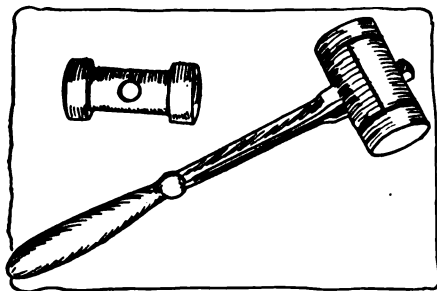
A small gasoline torch that is useful for soldering, hardening and tempering small tools and other work where a steady high temperature is required is the Imp, manufactured by the Carleton



Imp gasoline torch, which has no pump and is started with a match

Co., Boston, Mass. The little torch has a tank $3\frac{1}{8}$ inches high and $1\frac{1}{4}$ inches in diameter and holds 4 ounces, which is sufficient for about two hours' steady burning. The total height to the top of the Bunsen burner is $6\frac{3}{4}$ inches and the weight 4 ounces.

The torch is started by holding a match under the corrugations in the neck, which will cause sufficient pressure in the tank to send vaporized gasoline hissing out of the burner; a touch of the



Mach & Rebele's soft hammer has a metal handle and renewable head

match will ignite it and no further attention is required. For cleaning the fine hole in the burner a little reel of wire of the proper size is carried in a spring clip on the recessed bottom of the tank. The torch is of brass throughout, nickel plated. The price is \$1.50;

dealers, \$10 per dozen; in half-gross lots, \$9 per dozen; in gross lots, \$8 per dozen. Each torch is packed in a paper carton and is mailable.

Soft Hammer With Renewable Head.

A head that is easily removed and replaced when battered and worn is the feature of a soft hammer that is manufactured by Mach & Rebele, Inc., New York City.

The handle is of iron and practically indestructible. The head, which is of a special lead-base composition that will stand considerably more service than the ordinary lead hammer, is held in a split cylinder at the end of the handle; when a head is to be replaced the nut at the top of the handle is taken off, which allows the upper half of the clamping cylinder to slip off, releasing the head. The new head is inserted, the clamp top and nut replaced and the hammer is ready for use. The retail price is \$1 each; dealers, \$9 per dozen. New heads cost, retail, \$4.90 per dozen; dealers, \$4 per dozen.

Electrically Heated Glue Pot

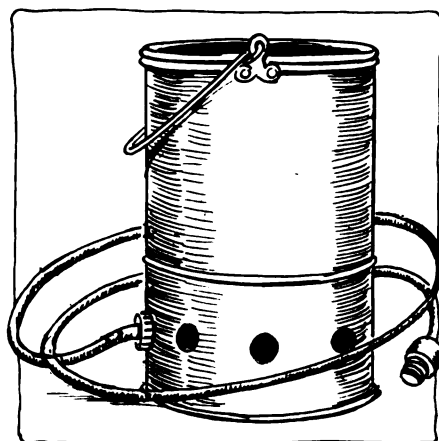
Electrically heated glue pots that can be carried about and connected to any electric light socket by means of a plug and cord are manufactured by Mabey's Electric & Mfg. Co., Indianapolis, Ind. Four sizes are made—1 pint, 1 quart, 2 quarts and 4 quarts capacity. The material used is heavy high grade galvanized iron.

The heating elements are made to suit any current supply, it being necessary to specify the voltage when ordering. A single heat is provided—that is, there is no heat regulation. On special order a two-heat element will be furnished. The current consumption is given by the makers as follows: 1 pint, 40 watts; 1 quart, 70 watts; 2 quarts, 90 watts; 4 quarts, 140 watts. Prices, 1 pint, \$2.75; dealers, \$2. 1 quart, \$3.50; dealers, \$2.25. 2 quarts, \$4.50; dealers, \$3.25; 4 quarts, \$6; dealers, \$4.

Perfect Holders for License Tags

A license tag holder that can be used wherever there is a rod from which the license tag can be swung—such as the rod running from one headlight to the other—is manufactured by the Cornelius-Browning Auto Co., Toledo, O. Each holder consists of a pair of clips, each clip being made up of two parts each having an angular groove at one end; one part has a slot and the other a

parts are put together with the grooves tongue at the opposite end. The two on the rod and the tongue extending through the slot in the license plate and the slot in the other half of the clip. A bolt and thumb-nut passing through both parts hold the clip firmly in place and by clamping tightly on the rod prevent swinging. Obviously no tools are re-



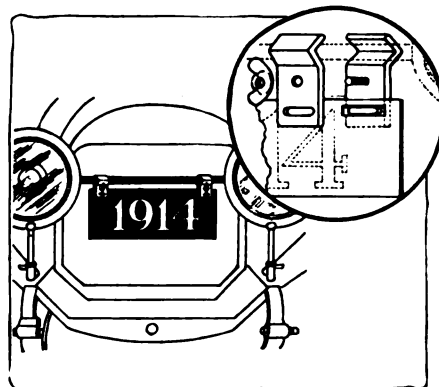
Mabey's glue-pot can be heated by connecting to any electric light socket

quired for attachment, the nut being tightened by hand.

The price is 50 cents per pair; dealers, \$3 per dozen; jobbers, \$1.20 per dozen. The clips are packed in individual paper boxes.

Essex Gun for Planetary Gears

A heavy self-filling dope and oil gun is manufactured by the G. B. Essex



Perfect license holders clamp rigidly to the front cross rod

Brass Co., Detroit; it is designed for forcing dope into planetary gearsets and rear axles. The barrel is $1\frac{1}{2}$ inches in diameter and 12 inches in length. Price, \$1.

GUNS FOR LIGHT AND HEAVY LUBRICANTS

Ratchets, Gears, Levers, Screws and Air Pressure Employed

Air Pressure Grease Gun

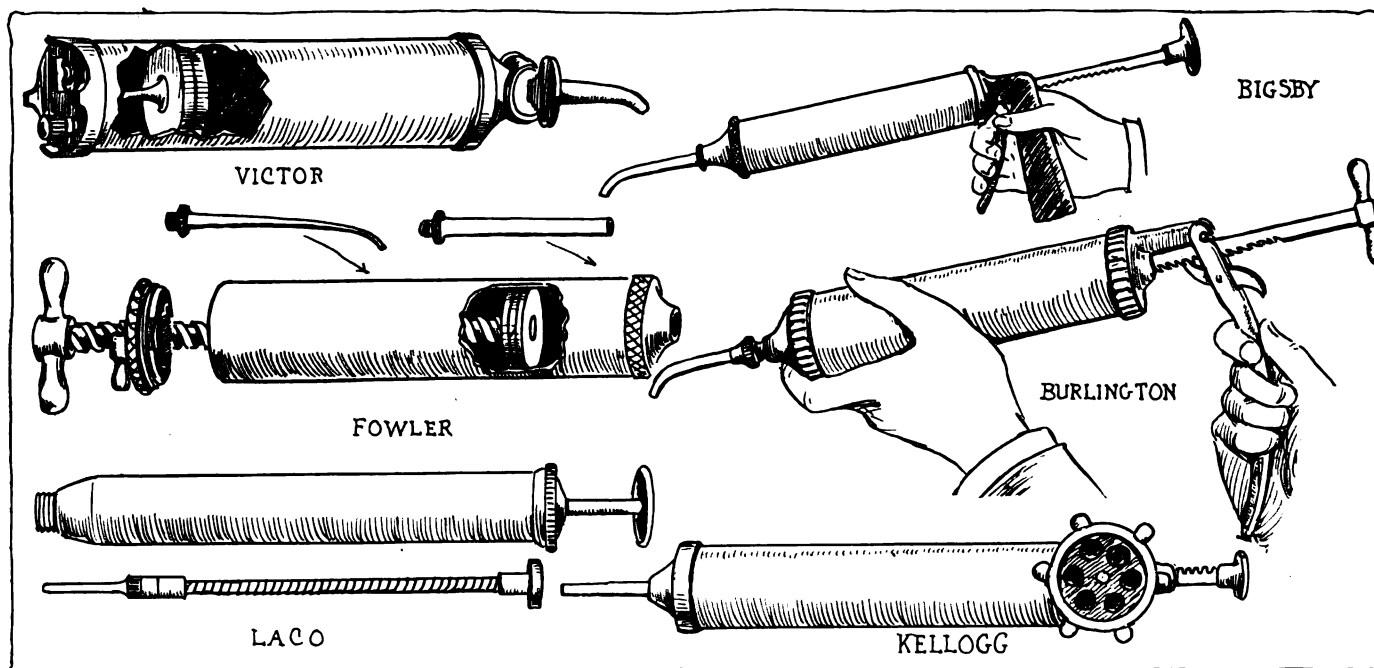
In the gun made by the Judd & Leland Mfg. Co., Clifton Springs, N. Y., the pressure of compressed air is used to drive the piston. An air connection is provided in the head of the pump to which a tire inflating hose is attached; if this is not available a hand pump can be used. The cylinder is 3 inches in

cylinder, which is then withdrawn, leaving the jacket in the grease. Next time the gun is to be filled it is inserted in the grease through the jacket. Two nozzles are supplied, one straight and the other bent. The gun is substantially made with a steel tubing cylinder 7 inches long and 2 inches in diameter. The price is \$1.75; dealers, 25 per cent.

angles, the leverage being sufficient to easily handle heavy grease. For lighter lubricants the handle can be used in the ordinary way. Two nozzles are supplied with each gun, one for grease and one for oil. Price, \$3.

Special Grease Guns for Fords

A new gun has been brought out by the Lubricating Accessories Co., Paterson, N. J., which is especially for use on Ford cars. It is made without the use of solder, rivets being used instead. The end of the barrel is threaded to fit



The Victor grease gun has no handle but is operated by air pressure. A quick-acting clutch on the Fowler gun permits its use with light or heavy lubricants. A special thread for Ford differentials is cut on the Laco. The Bigsby gun operates with a trigger, like an automatic pistol. Tremendous leverage is obtained by the ratchet mechanism of the Burlington Simplex. The Kellogg plunger is operated by a rack-and-pinion movement.

diameter, 12 inches long and holds 2 pounds of grease. It is of heavy steel tubing with heads of gray iron. It is finished throughout in brass plate. A reducing nozzle has a $\frac{3}{8}$ hole; price, \$4.

Grease Gun with Jacket

Grease guns are made in two models by the Raymond C. Agner Co., Burlington, Wis. The Burlington Simplex is of the type in which a lever and ratchet mechanism is used to handle heavy grease; the plunger is packed with two leather cups and will handle oil as well. The ratchet handle is detachably pivoted to lug attached to the cylinder cover and carries a dog which acts on teeth cut in the square plunger rod. An ingenious method of keeping the gun clean consists in the use of a metal jacket slipped over the cylinder; when the gun is to be loaded with grease the spout end is unscrewed and the open cylinder end inserted in the lubricant, jacket and all. The pulling up of the plunger fills the

A plain gun is made without the ratchet attachment and jacket; price, \$1.

Hand Wheel Moves Piston

The gun made by the Kellogg Mfg. Co., Rochester, N. Y., is of the combination type and can be used for light oil and heavy grease. For heavy lubricants a rack and pinion movement is used, the rack being cut in the plunger rod and the pinion attached to a hand wheel mounted on the head casting. For light lubricants, the pinion is thrown out of engagement with the rack. Rack and pinion are cut from steel and other parts are of brass. Two spouts are furnished with each gun. Price, \$1.75.

Trigger-Operated Grease Gun

The Bigsby-Rotary Mfg. Co., Cleveland, produces a gun made to operate with a ratchet action; teeth are cut in the plunger rod and a ratchet lever is pivoted in the handle attached to the head of the barrel and projecting at right

tap holes in Ford differentials. Spouts are riveted to spout hubs and the handle is riveted to the piston. Cylinders are of steel or brass tubing, $1\frac{1}{4}$ inches in diameter and 9 inches long; the heaviest grease and the lightest oil can be handled. The three models made are of the same size; No. 1 is of steel throughout and brass plated; price, 50 cents; No. 2 has brass cylinder and spout and a steel piston brass plated; price, 75 cents; No. 3 is like No. 2 except that it has a single brass plated flexible spout; price, \$1.

Quick-Acting Grease Guns

The Fowler Lamp & Mfg. Co., Chicago, makes a grease gun of the screw type for handling heavy grease which has a clutch device for releasing the screw to permit rapid action for handling oil. The barrel is of heavy brass with caps of cast brass, and a piston of brass with a cast iron packing ring. Price, \$2; dealers, \$1.50. The price is

33⅓ per cent less than formerly, the makers state.

B-Line Guns in Several Styles

Several models of grease and oil guns are manufactured by the Randall-Faichney Co., Boston. The Boston combination model is made in four sizes, 6-oz., \$2.50; 9-oz., \$3; 12-oz., \$3.50, and 16-oz., \$5. These guns will handle anything from gasoline to the heaviest grease. The plunger is of the screw type with a release to permit quick ac-

tion, and the handle is angular to give a good grip. They are of brass polished and lacquered. Equipment consists of flexible combination tip, plug and grease filler, the latter, an attachment for introducing grease into the barrel. The Boulevard gun handles oils and light greases; 6-oz., \$2; 9-oz., \$2.50; 12-oz., \$3; 16-oz., \$4. Back Bay, one-hand gun, 5-oz., \$2.25. Copley leather-packed oil guns, 5-oz., \$1.25; 8-oz., \$1.75; 12-oz., \$3.25; 36-oz., \$4.

per cent vegetable fiber is used. The impregnating compound used is hydrocarbon combined with volatile oil and chloride of sulphur, which cures the compound in the fabric. Both types of lining sell at the same prices. In the ⅜ thickness, 1-inch wide, 33 cents; 1¼, 38 cents; 1½, 42 cents; 1¾, 48 cents; 2-inch, 54 cents. In the 3/16 thickness, the prices are 44, 52, 60 and 71 cents, respectively.

BRAKE LINING FABRICS IN WIDE VARIETY

Asbestos Forms Base of Heat- and Wear-Resisting Friction Bands

J-M Non-Burn

The lining made by the H. W. Johns-Manville Co., New York, is a solid woven asbestos lining and is made in widths from 1 to 4 inches and four thicknesses, ⅛, 5/32, 3/16 and ¼. Each strand of asbestos is reinforced with interwoven brass wires. Price, 1½-inch width, 60, 65, 70 and 90 cents; 2-inch width, 80, 85, 90 and \$1.20. Brake lining is also sold in cartons containing pieces cut to exact lengths to fit the brake bands of most of the standard cars on the market, the object being to save the dealer time in cutting up lining and to eliminate waste and short ends. Customers also save time and are assured accurate fit.

Staybestos

Two grades of friction facing are made by the Staybestos Mfg. Co., Germantown, Philadelphia. S-M-C is woven of asbestos and brass wire in all regular widths and thicknesses and is impregnated; a special lining without wire is made for Ford cars. Universal lining also is a wireless lining for Fords and is put up in cartons containing sufficient lining and rivets to equip one car. Price, 50 cents per set.

Bestbestos

The brake lining manufactured by the Federal Asbestos Co., Paterson, N. J., under the trade name Bestbestos, is woven from long fiber Canadian asbestos yarn; the yarn is three-ply and has woven into it two strands of fine brass wire. After weaving, the fabric is impregnated to render it proof against water and oil, and is finally compressed to its proper density. All standard sizes are made from 1 inch to 6 inches wide and in four thicknesses from ⅛ to ¼ inch. The price of the ⅛-inch thick lining, 1 inch wide is 32 cents per foot; 1¼-inch, 36 cents; 1½-inch, 40 cents; 1¾-inch, 46 cents, and 2-inch, 52 cents.

In the 3/16 thickness, 1-inch, 42 cents; 1¼-inch, 50 cents; 1½-inch 58 cents; 1¾-inch, 68 cents, and 2-inch, 76 cents. A special wireless lining of composite weave is made in Ford width, 1⅛-inch, and is put up in boxes containing enough for one car together with rivets; the price is 75 cents per set. The dealers' discount on the standard lining is 70 per cent. Ford lining is sold also in 100-foot rolls.

Longwear

A single type of brake lining, designated as Longwear, is manufactured by the Asbestos & Rubber Works of New Jersey. The only materials used in weaving are asbestos fiber and brass wire; the fabric is put through an impregnating process after the weaving, rendering it proof against action of heat, oil and water.

The regular widths run from 1 inch to 6 inches and the thicknesses from ⅛ inch to ½ inch. The list prices for the ⅛ thickness are: 1-inch, 32 cents; 1¼-, 36; 1½-, 40; 1¾-, 46, and 2-inch, 52. In the 3/16 thickness the prices are 36, 42, 48 and 56 cents, respectively. The discount is 30 per cent.

Empire

Two types of brake lining, one folded and the other solid woven, are manufactured by the Empire Rubber & Tire Co., Trenton, N. J. Both are made in widths of from 1 inch to 4 inches and in thicknesses that are standard for such material—⅛-, 5/32-, 3/16- and ¼-inch. The folded lining is made of asbestos cloth with brass wire insertion; the fabric is impregnated with a toughening and heat-resisting compound and is hydraulically compressed. The woven lining is made from asbestos yarn containing two plies of asbestos fiber and two of .008 brass wire in the warp and three strands of asbestos and one of wire in the filler; there are 14 picks to the inch. Five

Rossendale

Brake linings are manufactured by the Rossendale-Reddaway Belting & Hose Co., Newark, N. J., in three types, asbestos, camel hair and solid woven cotton. Arabian asbestos lining is made from asbestos yarn with or without wire inserts and is chemically treated. Camel hair lining is a special textile product and the solid cotton lining is woven from long staple fibers. Asbestos lining is made in widths from ½ to 4 inches, camel hair lining runs up from ¾ to 40 inches, and cotton lining is in all standard widths. Asbestos and camel hair brake lining take the same prices, 1½ inches wide, 24 cents per foot; 2 inches, 34 cents, in standard thicknesses of 3/16 and ¼ inch.

Cork Insert

A brake lining is manufactured by the Cork Insert Co., Boston, which consists of Raysbestos equipped with cork inserts. The lining is supplied in any width from 1 to 6 inches and in all the regular thicknesses. Brake linings made by this process are applied in exactly the same manner as plain fabric brake linings.

The use of corks is intended to prevent glazing; they wear down at the same rate as the Raybestos and are unaffected by oil or dust. Prices per 100 feet, 1½ inches wide, ⅛, \$35.20; 3/16, \$38.40; ¼, \$43.80; 2-inch width, ⅛, \$45.52; 3/16, \$49.80; ¼, \$57. Dealers, 10 per cent.

Gripbestos

Two styles of brake lining are manufactured by the A. W. Chesterton Co., Boston, Gripbestos being solid woven and Metal Asbestos a folded lining. Both are made in widths of from 1 to 4 inches; Gripbestos is made in thicknesses of ⅛, 5/32, 3/16 and ¼, and Metal Asbestos, ⅛, 3/16, ¼. Prices, Gripbestos, in 1½-inch width, 40, 48, 58 and 76 cents; 2-inch width, 52, 64, 76 cents and \$1. Metal Asbestos, ⅛ and 3/16, 1½-inch width, 50 cents; ¼-inch, 60 cents; 2-inch widths, 80 and 90 cents. Garages, 75 per cent; jobbers, 85 per cent.

THE OAKLAND MOTOR COMPANY

REQUESTS THE HONOR OF YOUR
PRESENCE AT A SPECIAL
EXHIBIT OF
OAKLAND CARS
JANUARY TWENTY-FIFTH TO FEBRUARY SIXTH
INCLUSIVE
AT ANY TIME BETWEEN THE HOURS OF TEN
IN THE MORNING AND TEN-THIRTY
IN THE EVENING AT
1237-1241 WOODWARD AVENUE
DETROIT

For two and often three weeks after the local show the average salesroom presents a picture of innocuous desuetude. The atmosphere instead of being live, aggressive, and full of "punch" is charged with inaction. A dull languor prevails. It is often excused as a logical reaction from a week of strenuous effort. But in many cases the week has not been in any way remarkable for strenuosity of any sort.

There is no use attempting to explain it. The condition is known.

It is not only deadly—but dead costly to both dealer and salesman. How can you stir things up? How can you keep your salesmen in and at the same time keep your salesroom throbbing with action of the sort that increases sales and adds directly to the profit side of the ledger account?

If you want to know the answer that one concern is making to this problem, read this story.—Editor.

PHONE NORTH 1250 AND WE WILL CALL FOR YOU AND TAKE YOU HOME AGAIN
THIS IS AN EXCELLENT OPPORTUNITY TO EXAMINE THE OAKLAND MODELS WITHOUT ANY OBLIGATION ON YOUR PART
OAKLAND MOTOR COMPANY
1237-1241 WOODWARD AVENUE

Show Enthusiasm Made to Pay Dividends

Private Salesroom Show Will Bring "Best Two Weeks Business of Season"—Exhibit Simple to Stage

DEALERS everywhere are beginning to recognize the importance of some definite plan of follow-up after the show that will stimulate salesmen and the public alike and aid in the vital work of "cashing in" on the efforts of the preceding week.

While the show is on enthusiasm is rampant. Men are working under high pressure. In many cases noon meetings of salesmen are held daily and everything possible is done to secure profitable results. But when the show is over there is a decided tendency toward "sitting around" and talking over the events of the past week instead of putting forth the hard effort necessary to get the signature on the dotted line.

Well-Defined Plan, First

Salesmen are tired. Often the public seems tired. Something should be done to keep up the spirit of enthusiasm and the only way to accomplish this is to have a well-defined plan that intelligently copes with the situation.

And it is important to note that this plan should be put into immediate execution and not delayed until long after the salesmen have forgotten the little but significant details of conversation the correct memory of which is so vital in landing sales.

Most dealers realize the situation. But

many dealers neglect doing anything about it, with the result that many opportunities are overlooked and not infrequently the show is thus really barren of any concrete results. The books show that the expense of the show is a very real fact, but the sales seem to be far in the distant future.

Salesroom Made a Garden

It was the realization of these stern facts that led Manager Tracy of the Detroit branch of the Oakland Motor Car Co. to stage what is virtually a private follow-up show immediately after the regular show of the Detroit Automobile Dealers' Association.

The salesroom was transformed into a place of singular beauty by means of handsome floral decorations. The dominant motive was a conventional English garden. White picket fences surrounded the entire salesroom; at regular intervals there were tall columns on the top of which dainty baskets of flowers were placed. Pretty pink roses against the green of southern smilax literally filled these baskets and drooped gracefully down the columns. Festoons of southern smilax crossed and recrossed the ceiling and the same delicate vines were latticed in and out of the picket fence. Back of the fence and peeking through at artistic intervals were imitation holly-

hocks in many colors. The window was decorated with vines and flower boxes that gave an unusually attractive appearance to the salesroom and aroused the attention and interest of the passersby.

At noon each day the electric lights were turned on and kept on till 10:30 each evening. On the sales floor were six cars, a cut-open chassis, electrically operated, a Model 37 speedster, Model 37 roadster, touring car and cabriolet; also a 649 touring car.

Embossed Invitations Mailed

Handsomely embossed invitations requesting "the honor of your presence at a special exhibit of Oakland cars January twenty-fifth to February sixth inclusive" were mailed out to a list of 1300 names. Included with this invitation was a tiny card reading, "Phone North 2258 and we will call for you and take you home again. This is an excellent opportunity to examine the Oakland models without any obligation on your part." Besides these personal invitations public attention was called to the exhibit through advertisements appearing in the daily press.

"Though our special exhibit has been under way for only three days it is not too early for me to predict results of a very satisfactory nature," said Manager W. B. Tracy. "We are firmly convinced

that we have hit upon the right plan to sustain both the interest of the public and our own salesmen. Already we have made several sales.

"Before the two weeks are over we are confident that we will have written the best two weeks business for this season of the year that we have ever known. And even if we had not made a single sale I am now in a position to say that this is one of the very best things we have ever done. It is helping us to bring people to our salesroom while the salesroom looks particularly attractive and the influence is good.

Kill "Put-Off" Idea

"We have a full line of cars here and the special exhibit provides us with a reasonable reason for urging prospects to come and dig into the matter now. People like to put off at this season of the year. Our plan gives us a chance to kill that 'put off,' 'wait-a-little' idea. And we are doing it."

Every dealer can have a "private exhibit" and the plan followed by the Oakland company can be duplicated anywhere. Why not try it?

The Oakland Motor Car Co. Detroit branch is a regular subscriber to Motor World. Each week when Motor World comes in Manager Tracy reads it carefully. Articles that seem of importance and especially those bearing upon sales,

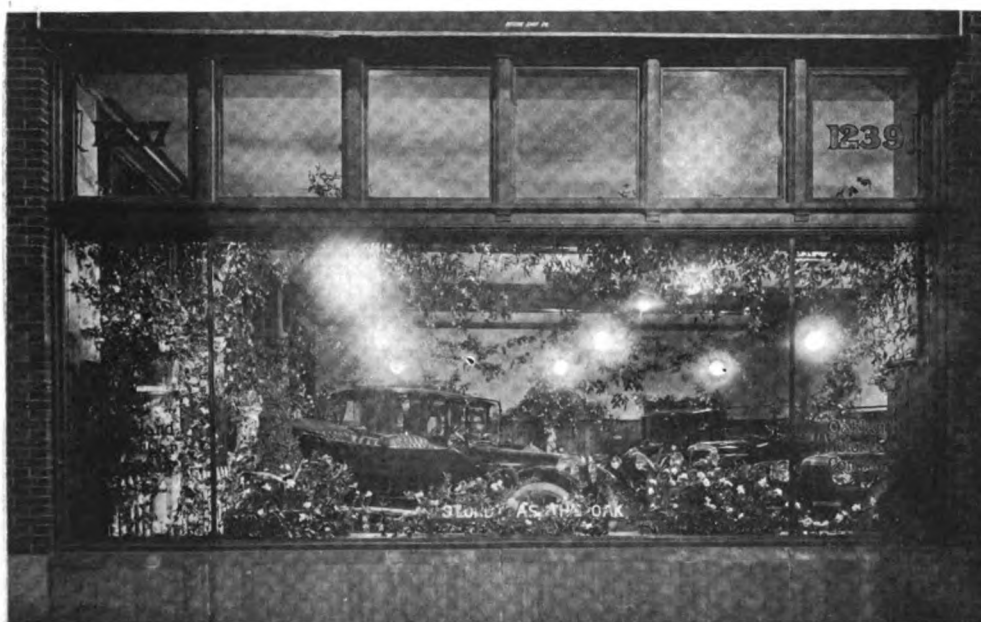


This shows the sign used outside to feature the display of new Oaklands. Two of these signs were used, one on the right side of the building and one on the service station

merchandising, store methods, etc., are carefully marked and commented upon. The paper is then directed to each salesman in turn. When he has read and digested the various items he passes it on to the next man.

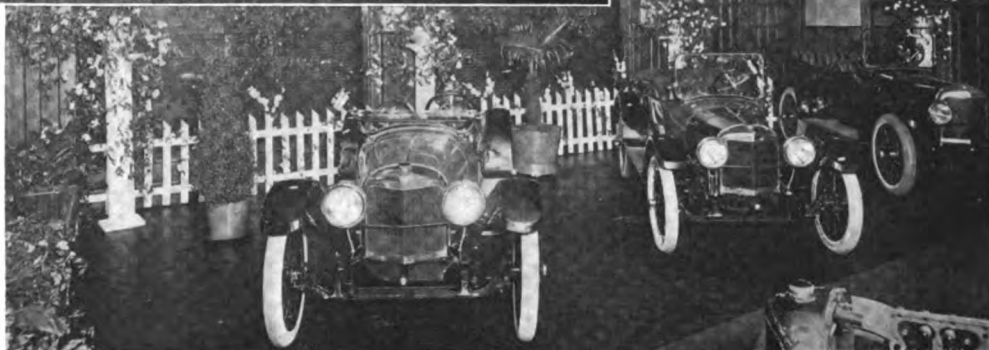
This is the profitable way to use Motor World. Don't just subscribe for it—READ IT—and see that your salesmen read it. You want more sales—you want

greater efficiency. Both will follow inevitably in the train of new ideas generated by a wider knowledge of the good methods employed by others. The way to cash in on a new idea is to use it. Think it over. Then remember **this** is the day of the man who acts. Procrastination is the thief of time and that other old saying to the effect that time is money still holds good.



The dominating motive was a conventional English garden. White picket fences surrounded the entire salesroom; at regular intervals there were tall columns with dainty baskets of flowers atop. Pink roses against the green of Southern smilax filled the baskets and trailed down the columns. Festoons of smilax crossed and recrossed the ceiling; the vines were interwoven through the pickets of the fence. Behind the fences were placed hollyhocks.

The salesroom was transformed into a place of beauty with the aid of trailing vines and potted plants. The wide windows were kept clear so that an unobstructed view of the interior might be had from the outside. Brilliant illumination from noon till night also played an important part in attracting attention to the special display which was made.



Light Farm Tractor for \$385

Universal Machine Has Compact Unit Power Plant With Worm Drive on Front Wheels.

A light farm tractor, driven by a V-type twin-cylinder motor and designed to do most of the field work usually accomplished by a team of horses, is manufactured by the Universal Tractor Mfg. Co., Columbus, O., and is sold at a price that is not the least attractive of its features from the user's point of view—\$385. The machine is delivered ready to run and is equipped with a standard pivot axle-riding cultivator and narrow rear end truck. A full set of

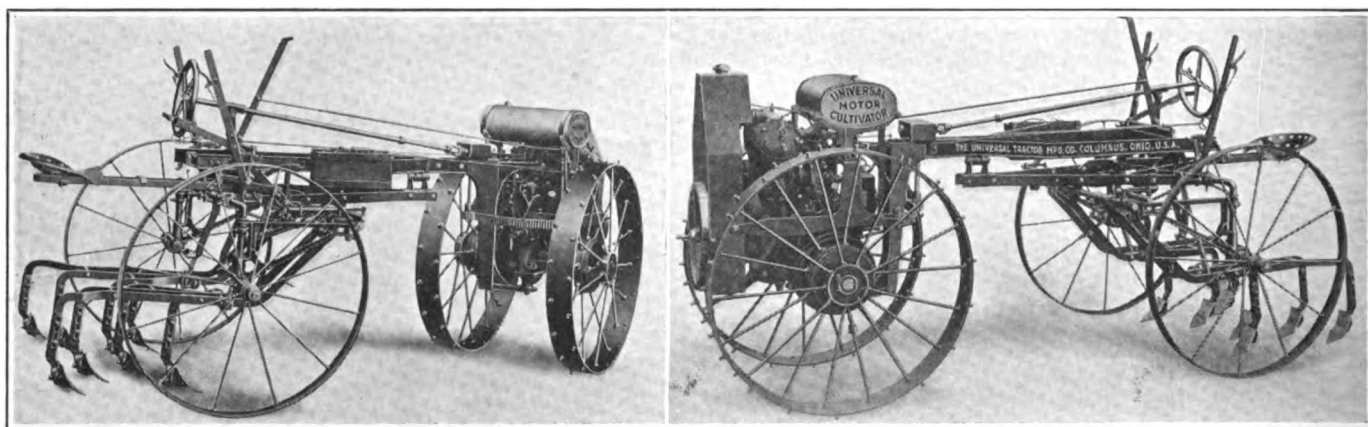
tended to carry a ball bearing worm driving to a phosphor bronze worm gear on a sleeve on the axle. Drive is from the sleeve to the axle through a clutch, and to the wheels through ratchets in the hubs which take the place of a differential. Reverse is obtained through planetary hub gears; there is but one speed forward and one reverse.

The crankshaft, which is counterbalanced, is of heat-treated steel and is hardened and ground; the front bearing,

on a bracket above the motor; the tank carries 5 gallons, which is said to be sufficient for an ordinary day's work.

Wheels are of steel, 40 inches in diameter, with 5-inch studded tires; for working in very soft ground wheels can be supplied with 10-inch tires. The minimum tread is 30 inches, which allows a cultivator to be driven between rows of corn. The turning radius of the machine is very short—shorter than that of a team. The speed can be regulated from 1 to 4 miles an hour.

The tractor is not designed and is not recommended for heavy plowing. It is light enough to go over soft ground and do cultivating without packing the soil; the makers state that sufficient weight for heavy plowing makes the machine too heavy for cultivating and the like. The tractor will cultivate in the field, orchard, vineyard or garden; will pull mower, rake, spike-tooth harrow, small



Motor, radiator, transmission and steering gear are mounted in a compact unit on the front wheels of the Universal farm tractor; the wheels turn together and are not mounted on knuckles. The machine is designed for light field work rather than heavy plowing

tools is carried in a tool roll. The weight is 1,000 pounds.

The machine consists of two main elements; the power plant is mounted on the two front wheels, together with the transmission and steering gear and all that pertains to the propulsive mechanism, while the agricultural implement, whatever it may be, is bolted to a forked beam extending backward from the tractor proper. The operator sits on a saddle on the implement, the steering wheel, of the regular motor car type, and the control levers being brought back to a point where he can reach them easily. The beam to which the trailing implement is attached is swiveled on the tractor by a king-bolt system; the steering gear turns the tractor as a whole, there being no knuckles, by means of a pinion and sector mechanism.

Compactness is a conspicuous feature of the power and transmission unit. The V-type motor is water-cooled and has cylinders, which are $3\frac{1}{2} \times 5$, and crankcase cast together, and removable cylinder heads; the usual yoke construction is used in attaching the connecting rods to the crank. The crankshaft is ex-

posed to carry the weight of the flywheel, which is 5 inches long; all are $1\frac{1}{4}$ inches in diameter. Valves have nickel steel heads welded to soft steel stems and allow an opening of $1\frac{1}{2}$ inches in the clear. The stem ends are hardened where they come in contact with the mushroom-headed pushrods. A single camshaft is made integral with the cams and is extended to carry a centrifugal governor which acts on the throttle and holds the speed of the motor constant at the point for which the hand control is set.

The radiator is of the tubular type and is mounted on the motor; the crankshaft passes through it and the flywheel, which has fan-blade spokes, is in front and delivers a rearward blast of air on the tubes. Circulation is by thermo-siphon. Lubrication is by splash, the oil being circulated by a plunger pump operated from the camshaft.

Ignition is by the Atwater Kent system, the current being supplied by six dry cells carried in a case. Under ordinary working conditions the battery is considered sufficient for a season's service. The carbureter is a Holly; fuel is fed to it by gravity from a tank carried

on a bracket above the motor; the tank carries 5 gallons, which is said to be sufficient for an ordinary day's work. It will operate planters, and it will drive stationary machines, such as feed cutters, corn-shellers, pumps, saws, washing machines, churns, and other light machinery, there being a belt pulley at the end of the shaft in front of the flywheel.

That Gasoline Tax Again

That proposal to tax every gallon of gasoline purchased by tourists outside of their home state 1 cent has cropped up again. This time, Commissioner J. N. Carlisle, of the Department of Highways, suggests that this would be a good way to raise part of the \$4,000,000 which he states, in his report just submitted to the legislature, is needed for road maintenance. He would also readjust license fees, and as a further means to make up some of the amount would impose a mileage charge on every mile covered by motor buses, because, he says, they run in competition with street railways and railroads, which are taxed.

Dealer Supply House

The RETAIL NEWS



Garage Repair Shop

The G. D. Roberts Co., Columbus, Wis., which has been operating a garage in connection with its vehicle and implement business, has sold its motor car department to Schultz & Harder. Frank Schmeid, for six years member of the Roberts firm, in charge of the garage, has disposed of his interest and intends to go into the garage business on his own account. A new building will be erected in Columbus at once for his occupancy.

The Appleton Ford Co. has been organized at Appleton, Wis., by J. F. Tolle-son, W. C. Hull and Theodore T. Stark, of Appleton, and R. A. Schwartzburg, of Milwaukee, to become representative for the Ford in the Fox River valley territory. The garage and salesrooms will be located in the farm machinery and implement warehouse of the Stark company at Appleton as soon as necessary improvements can be made.

Clodio & Engs, Inc., with offices at 1696 Broadway, New York, formerly occupied by the Kissel Motor Car Co., have taken over the distribution of the Kissel for the Metropolitan district. R. L. Engs, who has been identified with the Benz Automobile Sales Corp., which handles Benz automobiles and which also handled the Kissel Kar, will assume the presidency of the company. The management of the Benz business in this country has been left in the hands of P. V. Clodio.

There has been another change in the handling of the Garford and Willys Utility trucks in Boston, and the R. E. Taylor Co. that now has them as an agency proposition, has placed J. H. Cafferty, of New York, in charge as manager. They were handled first as an agency by the R. & L. Co. and later as a factory branch proposition.

Charles McCommons, of Milwaukee, has formed a partnership with A. Terwilliger, of Terwilliger & Son, Buick agent, Clinton, Wis., to represent the Dodge car. The new firm will be known as Terwilliger & McCommons. Terwilliger retains his interest in the firm of Terwilliger & Son, which continues to represent the Buick.

The Guaranty Used Motor Car Co. has been formed at Providence, R. I., to rebuild and market used cars. C. P. Walker, formerly with the Jackson agency in Boston, is at the head of the new concern and it has leased the two-story building on Atwells avenue formerly used by the White company for a service station.

The Grand Rapids Saxon Co., Grand Rapids, has been organized to act as distributor for the Saxon cars in this part of Michigan. William Rae is president of the concern; George A. Sinclair, vice-president, and R. A. Wellman, secretary-treasurer. Prior to the organization of the company Rae was Saxon representative.

The Cornelius-Browning Auto Co., Toledo, O., which was recently organized, is a partnership between R. C. Cornelius, for many years in the automobile business here and who has handled the Krit cars, and H. B. Browning, a business man. The new concern has taken a five-year lease at 817 Jefferson avenue.

E. A. Klatt, senior member of the firm of Klatt & Rider, conducting a garage and agency at Algoma, Wis., has disposed of his interest to William A. Neesemann, and the firm name has been changed to Rider & Neesemann Automobile Co. The concern will be incorporated soon. It represents the Ford.

Carl M. Nelson, of Waupaca, Wis., has purchased the garage and business of the Manawa Garage Co., Manawa, Wis., and takes immediate possession. Mr. Nelson has been in charge of the machinery department of the A. M. Hansen Co., Waupaca, for nine years and is a machinist of 24 years' experience.

The Metz Garage Co., Grand Rapids, Western Michigan selling agents for the Chevrolet, has made arrangements for a new salesroom and garage which will occupy a piece of ground 43 x 148 feet on Island street. It will be a two-story and basement structure and will also house the Beelby Supply Co.

M. E. Laux, who has conducted a large garage and repair-shop at 7th and Wisconsin streets, Racine, Wis., for several years, has formed a partnership with John Smader, of Caledonia, Wis., and henceforth the concern will be known as Laux & Smader, handling the Lewis, Ford, Buick and Sphinx.

The Grasser Motor Co., Toledo, which handles the Hupmobile, Dodge and Milburn automobiles, has moved into the large building formerly occupied by the Blevins Auto Sales Co., 1101 Madison avenue, where both the salesrooms and service departments are now under the same roof.

W. J. Damoth and J. H. Metcalf have formed the Remington Sales Co., with headquarters at Damoth's garage, Grand Rapids, pending the opening of more suitable quarters. They have secured the agency for the Remington cars for Western Michigan.

The Foster Motor Sales Co., 1751 Woodward avenue, Detroit, has been made distributor of the Briscoe and Argo in Detroit and Wayne county, also Macomb, Oakland and Washtenaw counties. The company will continue to handle the Imperial.

The Stearns distributor in Kansas City territory has reincorporated under the title Scarritt Motor Car Co., the old firm name being White Motors Co. The company controls Stearns business in Kansas, Western Missouri and Northern Oklahoma.

A loss of \$40,000, partially covered by insurance, was sustained by Turner

Bros., Portland, Ore., when their garage was ravaged by fire that destroyed 23 automobiles. Fire was caused from overheated stove in the office of garage.

The McGivern Motor Co., Davenport, Ia., has bought the Wagner Motor Co. and is now distributor of the Mitchell in Eastern Iowa and Rock Island county, Ill. The Wagner headquarters at 115 Jefferson street will be continued.

The Ennis Auto Top Co., Hartford, Conn., has been organized by Ed. C. Ennis, former manager of the leather trimming and upholstery department of the Pope Mfg. Co. Headquarters are at 436 Capitol avenue.

The Ohio Electric Sales Co., Detroit, has been formed by H. W. Jameson, W. J. Gordon, W. G. Lynn and F. E. Hollister to handle the Ohio electric cars. Headquarters have been opened at 1000 Woodward avenue.

B. A. Rhoads, of Sandy Lake, Pa., has bought the site of the old Excelsior stock stables and will build a large garage soon. He has the agency for the Ford in Sandy Lake, Mill Creek and New Vernon townships.

Judge Hugo Wegener, who has represented the Kissel car at Marshfield, Wis., for some time, has established a salesroom and garage and taken on the Grant agency. Frank Zettler has been appointed manager.

William W. Hodge and Robert Seymour have formed the White Motor Co., Worcester, Mass., to handle White cars and trucks. The salesrooms are at 142 Foster street and the service station at 177 Pleasant street.

Robert I. Eads, formerly manager of the New England branch of the Premier Motor Car Co., and Charles Loud, who was identified with the same concern, have formed a company to handle the Premier for New England with headquarters in Boston.

The Peerless Rubber & Tire Co., Toledo, has moved from Madison avenue to 711 Jefferson avenue. The company is distributor for the Miller tires and also handles a complete line of all sorts of tire accessories.

Charles E. Huey and Frank E. Moorehead Indiana, Pa., have sold their interest in the garage of the Arrow Motor Co. of that place to Charles I. Moore, of Indiana, who will make extensive improvements.

A new salesroom is to be erected on Woodward avenue between Medbury and Hendrie avenues, Detroit, for the Winton Motor Car Co. The new headquarters will consist of a two-story building, 71 x 212 feet.

The Toonen-Barlament-Wright Co., De Pere, Wis., has taken occupancy of its large garage addition, giving a floor space of 50 x 120 feet, with entrances on two streets. A repair-shop is being installed.

C. E. Vaughan and Melbourne Vanden Berg, formerly with the Cadillac agency, will conduct a general repair business in Grand Rapids, Mich., under the firm name of Vanden Berg & Vaughan.

John W. Phillips and W. J. Fisher have formed the Grant Motor Sales Co., Toledo, having secured the selling rights for Northwestern Ohio. Salesrooms have been opened at 1014 Madison avenue.

The White Motor Sales Co., Akron, O., is negotiating for the Miller property at 199 East Market street, which will be turned into a garage. The company will operate a repair shop and sales agency.

County Controller Harry Kisinger, Uniontown, Pa., and his son, Arley W. Kisinger, of Brownsville, Pa., will start a new taxicab service at the latter place this month. They will use five Hupmobiles.

Herman Platt has purchased the Gollmer Garage at Baraboo, Wis. He is a brother to William Platt, who purchased the machine-shop department of the Gollmar Bros. Co. several months ago.

The accessory business conducted by McLean & Freeman, at 1575 Woodward avenue, Detroit, has been taken over by E. Mack Morris, formerly assistant secretary of the Northern Motor Car Co.

Plans for the Huddle Garage, Lancaster, O., to replace the one destroyed by fire recently, have been completed and the contract will be awarded soon. The new structure will be 185 x 86 feet.

The Buick agency in Providence, R. I., is now located in its new home at 37 Chestnut street, where it has the entire building for a salesroom and service station near the main arteries of travel.

Trucks only will be sold by the newly organized E. E. Moser Co., which has opened salesrooms at 2218 Farnam street, Omaha. The Commerce, Denby, Federal and Standard are handled.

The Shaw Motor Co., Uniontown, Pa., has opened a branch garage at 312 South Pittsburg street, Connellsville, Pa. The concern has a general agency for the Ford cars in Fayette county, Pa.

H. D. Mintz has purchased the City Garage, Grand Rapids, Wis., from Jacobson & Holliday, and taken immediate charge. Mintz will install a machine shop and vulcanizing department.

The name of the Tulsa, Okla., Cadillac agency has been changed to New Cadillac Co. of Oklahoma. The members of the company are Guy M. Davis, G. E. De Hart and E. D. Wertzberger.

Floyd H. Johnson has opened a garage and showroom on West Broadway, Mt. Pleasant, Mich. He has taken the agency for the Ford for Mt. Pleasant and twelve townships of the county.

An agency will be opened in Duluth, by the Fisk Rubber Co., and Fred W. Neumann, who has been manager of the Duluth Auto Supply Co. during the last four years, will be in charge.

The Williams Motor Car Co., agent for the Dodge Bros. car at Springfield, has just moved into its new salesrooms in the building at the corner of Worthington and Chestnut streets.

L. T. Vaughan, formerly in charge of the repair and service department of the Oakland Motor Car Co., Pontiac, has opened a garage and repair-shop in the Osmun & Graley building.

The J. N. MacDonald Co., Wethersfield, Conn., has purchased a controlling

interest in the Hartford Garage Co., Hartford, and will continue to handle the Allen and Velie cars.

C. M. Sackman and B. A. Guillamue have formed a partnership at Springfield, O., to operate a taxicab service. The firm will occupy the quarters vacated by the Prince Motor Car Co.

An automobile salesroom and garage will be opened in the Brewer building, Marshall, Mich., by O. L. Linn and R. S. Scott, who have taken the agency for the Briscoe and Argo.

A partnership has been formed between J. Wetzel and Charles M. Hall, who was formerly manager of the Parish Mfg. Co., Detroit. They will handle automobile accessories.

The Iowa County Automobile Co., Dodgeville, Wis., contemplates the erection of a large addition to its garage and salesrooms and will install additional equipment.

E. A. Gilmore, Boston, who has the New England agency for the Lewis line, has just closed with the Allen Motor Car Co. to handle that line in the same territory.

William Millus and Charles Nelson, of Almond, have purchased the Almond Garage Co., Almond, Wis., and will install additional machinery and vulcanizing appliances.

George H. Mahan, for a long time in the motor oil field in New England, has taken the agency for the S-P Vaporizer with headquarters at 32 Oliver street, Boston.

William Koehler, proprietor of the Koehler Garage at Marshfield, Wis., is contemplating the erection of an addition that will double the size and capacity.

The J. S. Morris Carriage Co., Wampun, Wis., has made an installation of oxy-hydrogen welding and cutting apparatus and will specialize in motor car work.

Sauerberg & Cummings is the name of a new automobile repair and painting business which has its quarters at 224 North Division avenue, Grand Rapids.

The name of the Selden-Maxwell Co., St. Joseph, Mo., has been changed to Maxwell-Hudson Motor Co., headquarters being at 11th and Faraon streets.

A garage and salesroom will be built on North Michigan avenue, Big Rapids, Mich., for L. F. Bertrau, agent for Studebaker, Reo, Dodge and Ford cars.

The W. J. Dabney Co., Atlanta, Ga., has secured the agency for the Maxwell and Paige-Detroit cars. Headquarters have been opened at 96 Forsyth street.

E. H. Jones & Son have purchased the Weyauwega Garage, Weyauwega, Wis., and will continue the business under the style Jones Auto Sales Co.

E. J. French, who represents the Overland in Manistique, will open an agency in Escabana, Mich., as soon as he has found a suitable location for a store.

W. B. Hamilton has opened a new automobile supply and accessory store in Salt Lake City. He was formerly with the Bertram Motor Supply Co.

The Dubuque Tire & Vulcanizing Works, Dubuque, Ia., is a new concern which has located at 1447 Clay street. L. Floyd Huntington is manager.

A garage has been opened in Byron Center, Mich., by De Weerd, Holleman & De Weerd, who have the Ford and Overland agency in Grand Rapids.

Charles Seigel has disposed of his interest in the Marcellus, Mich., Maxwell agency to Don Kuhn. The name of the agency is now Thomas & Kuhn.

Hughson & Merton, which firm operates a chain of accessory stores on the Pacific Coast, have been appointed Coast distributors for Gray & Davis.

Christian A. Kinney, Colfax, Wis., is preparing to erect a large fireproof garage and repair-shop building. Kinney has sold his present garage.

Thomas Paquin, who has been in the motor business on South Main street, Fall River, Mass., has just taken the agency for the Maxwell line.

The Le Due Auto Top Co., Toledo, has secured the agency for the new Ford limousine top, made by Paul E. Heinsohn, Ionia, Mich.

A garage and salesroom has been opened in the Spinney block, Alma, Mich., by Milton M. Perrigo, agent for the Studebaker.

George Petit has become a partner of M. P. Bromeling in the latter's automobile and hardware business in Eaton Rapids, Mich.

Frank L. Brown, formerly with the Stutz in Boston, has formed the Brown-Apperson Co., Boston, to handle the Apperson line.

The Marathon Motor Car Co., Merrill, Wis., has moved to new and larger quarters on Main street and will enlarge its facilities.

J. Franklin Brown has formed a company in Boston, known as the Dunlap-Brown Co., to handle Graphinol in that territory.

The Peerless Tire & Rubber Co., Toledo, O., will move shortly into its new and larger quarters at 713 Jefferson avenue.

The Pacific Coast distributing agency for the Genemotor has been placed with Chanslor & Lyons by the General Electric Co.

The Wilkinson Automobile Exchange, New Orleans, La., has taken a three years lease on the Revol building, Julia street.

Albert Swanson has purchased M. Cavalette's interest in the Running & Cavalette Garage, Bessemer, Mich.

A garage has been opened on Huron avenue, Harbor Beach, Mich., by Frank E. Mahan and Fred Gertenschlager.

C. E. Dunn, of Shawano, Wis., will establish an exclusive tire and vulcanizing shop in Shawano about April 1.

E. Y. Simpson, Boston, has taken the agency for the Milburn electrics, with salesrooms at 650 Beacon street.

The Pilot Car Sales Agency, under the management of Stratton & Barager, will handle the Pilot in Seattle, Wash.

The Garland Automobile Co., Broadway and 62nd street, New York, will handle the Interstate car.

The Stutz Automobile Co., St. Louis, has moved to its new headquarters at 4130 Olive street.

Edward I. Rumsey, 21 Selden avenue, Detroit, has taken the agency for the Milburn electrics.

Goodyear truck tires will be handled in Tacoma hereafter by the West Coast Wagon Co.

W. H. Fenton and E. W. Fenton, of Eugene, Ore., have taken over the Buick garage.

A new garage has been started in Big Rapids, Mich., by L. F. Bertrau.



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Time Is Money

AS trite as the old saying may be, it does not appear that there are as many dealers and garagemen who appreciate that time is money as might be the case. Too often is there a feeling to let well enough alone rather than one which prompts an exercise of energy or inventive faculty to cut down the time required for a given job and thus to obtain better results.

But in the Hudson service station, which is described elsewhere in this issue, the let-well-enough-alone theory has no place. Much time was being lost by confusion in the shop and by the necessity of having workmen that should be otherwise employed moving cars into their proper position.

The scheme that was adopted is an unusual one and one which shows a keen insight into human nature. It reveals that someone has delved into the psychology of the mind. And this might be done more often to good purpose.

Making Owners Work

The Hudson people have made a game of having the cars properly placed, not by the workmen but by the owners of the cars themselves. They have, not openly but in a subtle manner, questioned the ability of the owner to drive his car along a couple of chalked lines. They have, in short, issued a sort of challenge which few owners are slow to accept.

What is the net result of the plan? When the owner is requested to place his car in a certain position, directly over a couple of lines, an indirect appeal

is made to his vanity. In his desire to show his skill in handling the car he invariably places it exactly where it is wanted. And because of this, there is exactly enough room on each side and at the front and back for workmen. So confusion is avoided and the workmen waste no time in moving cars.

A Convertible Body

STANDING beside a body exhibit in the Minneapolis show we were impressed with the favorable comments made by show visitors on a touring car beside which stood a detachable limousine type of top that fitted over the open body, making it an ideal winter job.

The idea of a regular open body to which could be fitted at nominal cost a cover or top with regular glass windows, so that the completed job had all of the earmarks of a complete winter vehicle, appealed very strongly to many.

Body Top Appeals.

It seemed amazingly more sensible than where an entire new body has to be purchased. When you buy a winter body it costs something to replace it with the summer body. You must have the fenders painted when changing from summer to winter and vice versa. This is but one of the several additional expenses. Not so with the new combination scheme in which the regular summer touring body is used in winter, and on top of it placed the enclosed part. This type is sure to make strong gains within the next year, and dealers would do well to see to it that this end of the business is not overlooked next fall.

Generalship Needed

TODAY many manufacturers are in a landslide towards eights. They cannot seem to get them out fast enough. If the public wants the eight in preference to the six or four, then the dealer should find this out in his own territory and frame his own policy accordingly. These are days when the dealer must be a general of generals, when he must be prepared to stand on his own feet, when he must have a mind of his own, and when he must be prepared to cope with the new problems that are brought face to face with him.

These are days when the dealer must live by the sweat of his brow. It will take real salesmanship to sell sixes if eights are in greater demand; and it will take real salesmanship to dispose of eights if sixes or fours are preferred. The present movement is going to make selling more difficult. Instead of disposing of your output of sixes on the crest of the wave, a division has presented itself, the momentum of past years has been divided, and only the concentration and harder work of the dealer and his selling force can make up for this handicap.

SECOND MONTREAL SHOW ATTRACTS 50,000 PEOPLE

Dealers Do Good Business and Are Satisfied—Demand Chiefly for Cars
Selling at \$1,000 to
\$2,000

The second annual motor show held under the auspices of the Montreal Automobile Trade Association took place from January 23 to 30 and was a huge success from all viewpoints. The attendance, which totaled about 50,000 for the week, averaged 8,000 nightly and was largely in excess of last year. The new Ford company's building was utilized to house the 50-odd exhibits showing 28 makes and about 250 cars.

A general canvass of the dealers revealed a statement that a show is really a necessity and that the prospects developed from it were profitable in the long run. One representative dealer expressed himself to the effect that general conditions could not be as bad as so many picture them, but on the other hand they felt that the country and trade were in an exceptionally healthy state and that results for the coming year were going to be highly satisfactory. The coming season, they prophesy, will eclipse any other season in number of sales made.

The demand at the show was confined principally to cars selling at \$1,000 to \$2,000. The cheaper cars at the show made a stronger bid for recognition than ever before.

Consolidated Building Bigger Car

Although the Consolidated Car Co., Detroit, which recently took over the manufacture of Abbott-Detroit cars, exhibited at the automobile shows a car equipped with a $3\frac{1}{2} \times 4\frac{1}{2}$ Perkins eight-cylinder engine, the car selling in five-passenger form for \$1,685, the concern has decided not to market this car, but instead is bringing out a somewhat larger eight-cylinder model. This is to be equipped with a 3×5 Herschell-Spillman eight-cylinder motor and equipped with a seven-passenger body, selling for \$2,085. The wheelbase is 121 inches, while the first-designed eight had 116-inch wheelbase. A heavier gearset and drive system is used, and the popular divided front seat feature is to be incorporated in the body construction.

S. R. K. Motor Co. Will Build Strouse

The S. R. K. Motor Co. has been organized in Detroit to make the Strouse light cars. The capital stock of the new company will be \$100,000. The incorporators are Clarence E. Strouse, designer of the car; F. T. Ranney, a real estate dealer, and Thomas D. Knight, a

retired Chicago lawyer. The car has a four-cylinder block Hermann motor, $2\frac{1}{2} \times 4$, 100-inch wheelbase, tread either 42 or 56 inches, 28 x 3-inch front and rear tires, gearless transmission, and will sell for \$325 with the small tread and for \$350 with the standard tread of 56 inches.

Many Rayfield Service Stations Added

The Findeisen & Kropf Mfg. Co. has added the following to its already long list of service stations:

Alton Automobile Co.	Alton, Ill.
C. U. Williams & Sons Co.	Bloomington, Ill.
Claremont Garage	Chicago, Ill.
Galena Repair Co.	Galena, Ill.
Galesburg Machine Works	Galesburg, Ill.
Herbert I. Stevens	Kankakee, Ill.
Tendens & Dystrup	Lemont, Ill.
Graham & Handel	Mt. Carroll, Ill.
Hackney & Borgers	Murphysboro, Ill.
Radway Garage	Oak Park, Ill.
Jauch's Magneto Shop	Streator, Ill.
Bertram Motor Supply Co.	Boise, Idaho
Star Repair Shop	Logansport, Ind.
Oakland Sales Co.	Muncie, Ind.
Richmond Garage	Richmond, Ind.
Grey's Auto Repair Shop	Burlington, Ia.
Banker Auto Co.	Muscataine, Ia.
Samuel E. Cass, Inc.	Haverhill, Mass.
Plank & Morgan	Worcester, Mass.
M. H. Wood & Co.	Joplin, Mo.
Johnson's Auto. Works	Kansas City, Mo.
Bart S. Adams	St. Louis, Mo.
W. H. Dutton Co.	Morristown, N. J.
Stidworthy Bros.	Netcong, N. J.
Albany Garage	Brooklyn, N. Y.
Madison Garage	Brooklyn, N. Y.
Empire Automobile Co.	Glens Falls, N. Y.
E. D. & A. F. Cronk, Inc.	Utica, N. Y.
Firestone Garage	Dayton, O.
Central Motor Co.	Hamilton, O.
Duffy Tire & Supply Co.	Lancaster, O.
Marietta Motor Car Co.	Marietta, O.
Price Garage	Zanesville, O.
Garvey & Malerich	Oil City, Pa.
J. M. Rattie	Pawtucket, R. I.
Pilot Garage	Providence, R. I.
C. D. Frank & Co., Ind.	Charleston, S. C.
Consolidated Auto Co.	Columbia, S. C.
Bellingham Auto Sup. Co.	Bellingham, Wash.
Standard Automobile Co.	Wheeling, W. Va.
Howard Motor & Cycle Co., Ltd.	Brisbane, Queensland, Australia

Locomobile Branch Territory Increased

Frank H. Bowen has been made manager of the sales department of the New York branch of the Locomobile Co. of America. Bowen has been engaged in the sales of S. G. V. and Simplex cars for the past six years. At the same time the territory of the New York branch has been extended to include the whole of New York state, both wholesale and retail, and negotiations are at present under way for the establishment of agencies in some of the larger cities up state.

New England Organization Taking Form

President George P. Brophy, of the Boston Accessory Dealers Association, spent last week delivering talks to motor and accessory men at Providence, R. I., New Bedford and Taunton, Mass., in his plan of campaign for the formation of a New England organization. He reports that he is meeting with much success.

Chandler Additions Make Progress

Work on extensive additions to the plant of the Chandler Motor Car Co., Cleveland, has been started and will be finished in 90 days. The enlarged plant will make possible the building of 1,000 cars per month.

COLUMBUS SHOW AVERAGES 2000 ADMISSIONS A DAY

Most Successful from Dealers' Point of View—Many Individual Sales Made and New Dealers Appointed

The most successful Columbus (O.) automobile show, from the dealers' standpoint, closed February 6 with an average of 2,000 paid admissions recorded for the seven days the cars were exhibited. There was a total of 55 exhibitors, of which 27 exhibited cars, 4 showed trucks and 24 displayed accessories.

Among the dealers who made retail sales during the show and the number of sales reported were: The Curtin-Williams Auto Co., six Cadillacs; Brasher Motor Car Co., three Coles; J. I. Case T. M. Co., five Case cars; Broad-Oak Auto Co., three Chalmers; International Harvester Co., four International trucks; Auto Inn & Exchange, four King cars; Ohio Auto Sales Co., seventeen Dodge Bros. cars; Everitt Auto Sales Co., ninety-six Maxwell cars at wholesale and one Maxwell at retail; Winders Motor Sales Co., one Velie; Barr Motorcycle Co., one Franklin; Twyman Motor Car Co., two Interstate cars; Electric Auto Sales and Service Co., one Ohio electric; Standard Motor Car Co., one Hudson and two Milburn electrics; Capital Motor Car Co., six Reo cars.

It was announced that the Winders Motor Sales Co., Columbus, will in the future have the agency in Central Ohio for the Chevrolet car, formerly sold by the Daniell Motor Car Co.

The Auto Inn & Exchange closed contracts with the following new dealers to handle the King in their respective towns: Star Motor Car Co., Lancaster, O.; E. W. Cork, Crooksville, O.; E. R. Stockwell, Mechanicsburg, O.; E. C. Mikesell, New Paris, O., and by the same firm to handle the Briscoe: C. A. White & Son, Delaware; S. E. Forsythe, Newark, and Roberts & Perry, Richwood, O.

G. M. C. Holds 3-Days Convention

A three-days convention of the district sales managers of the General Motors Truck Co. was brought to a close February 4. According to all present, and they came from all parts of the United States, the automobile truck business outlook is decidedly encouraging. In fact, during the last few weeks conditions have shown up in such satisfactory shape that it is expected this will be a bigger year in the truck business than 1914. Among those present were: Z. C. Elkin, Chicago; C. B. Warren, New York; W. H. Barnes, San Francisco, Cal.; N. E. Sutton, St. Louis, Mo.; O. E. Stoll, Philadelphia, Pa.; M.

E. Brackett, Boston, Mass.; Estel Scott, Kansas City, Mo. General Sales Manager W. K. Chilcott of the G. M. T. presided.

Winternitz Purchases Krit Assets

The combined assets of the Krit Motor Car Co. and the Krit Sales Co., Detroit, which had been appraised by these companies at a total of \$879,347.97 and by the official appraisers at \$210,436, were purchased February 5 for \$120,000 by Samuel Winternitz & Co., Chicago, the sale being confirmed by the referee in bankruptcy.

The Winternitz company obtains stock of material, finished and unfinished cars and chassis, having a total value of \$161,546.03; factory equipment, tools, jigs, office furniture, etc., valued at \$21,453.71; patterns, dies, drawings, valued at \$2,500; ten automobiles and trucks used by the Krit plant and valued at \$3,375; equity in buildings, land and in land contract covering the premises on which the Krit Motor Car Co. is located, valued at \$15,000; stocks of parts, tools, supplies, office furniture and fixtures, located in the Philadelphia branch, valued at \$6,561.28.

The Winternitz company states that it is the intention to reorganize the Krit company. An announcement will be made as soon as the plans have been perfected. "We are going to complete all the unfinished cars and with the material on hand build new ones, and hope to have the reorganized company in running order very shortly," said one of the officials of the Chicago company.

Lozier Assets Bring One Million

One million dollars was bid and accepted February 5 for the total assets of the bankrupt Lozier Motor Co. The manufacturers are the Frank Bros. Iron & Metal Co. and the Harris Bros. Co., both of Detroit, and Theodore Friedberg and Charles Shongood, both of New York.

Frank stated that the Lozier Motor Co. will be operated as a going concern and within the next ten days a new company will be organized with sufficient capital to permit the immediate reopening of the plant. There is a possibility that the Plattsburg property will remain closed for the time being or disposed of to other parties.

It is estimated that after all the expenses are paid, such as court fees, attorneys' bills, etc., there will be sufficient funds to eventually pay about 30 per cent of their claims to the creditors.

According to the sales agreement, \$200,000 is to be paid in cash, half within 90 days and the other \$100,000 within six months; the balance of \$800,000 to be settled within one year, with the privilege of the purchasers returning the real estate in Detroit within the next eight months on a basis of \$300,000.

AN EIGHT CYLINDER CAR FOR LESS THAN \$1,000

**Lewis Spring & Axle Co. Announces
New Model at \$985—It is the
Hollier and Has 5-Passenger
Touring Body**

The Lewis Spring & Axle Co., Jackson, Mich., has just announced an eight-cylinder five-passenger car to sell at the record low figure for this type of machine of \$985, equipped. The car is known as the Hollier Eight, and it is not assembled but is manufactured complete in the Lewis factory.

Equipped with a 3 x 4 1/4 V-type motor, with the two blocks of four cylinders set at 90 degrees to each other on an aluminum crankcase, the motor in its general design adheres to the recognized practice for engines of this class. Suspension is at three points. Specifications of the chassis include a 12-inch cone clutch, three-speed gearset, combination motor-generator for cranking and lighting which is attached to the gearbox, floating rear axle with annular bearings, 40-inch cantilever rear springs, 112-inch wheelbase, standard tread, and 32 x 3 1/2 tires on demountable rims. The equipment is in accordance with present-day requirements.

The Lewis concern has been working on this car for about eight months, but has kept the fact a profound secret until the present time. Active manufacture and distribution of the Hollier is to begin at once. It is stated that 3,000 cars will be built this year and that the first of them will be ready March 1. Fred Darling, Jackson distributor for the Northwest, has been appointed Northwest district sales manager.

Car Shipments to Dealers Increased

At the last meeting of the directors of the National Automobile Chamber of Commerce, which was held in Chicago during the show, it was brought out that during 1914 138,250 carloads of motor cars were shipped to dealers, this figure representing an increase of about 14 per cent over the year 1913.

The traffic committee reported that the Traffic Department is watching closely proceedings before the Interstate Commerce Commission on the proposed extra charge by railroads for placing cars on factory sidings. This has always been considered as included in freight charges and it is expected that the N. A. C. C., as well as all other shipping interests, will resist any effort to charge for this service.

Another matter which is being strongly resisted is a suggestion by some of the Southern railroads that motor cars be accepted for shipment only when the tops

are removed or that a higher rate be charged; also that cars must in all cases be covered when shipped and that all detachable parts be removed and placed in iron-bound boxes.

Partin-Palmer May Reorganize

Three creditors whose claims aggregate \$700 have made application to adjudicate bankrupt the American Mfg. Co., builder of Partin-Palmer cars. The American Mfg. Co. is a Chicago concern, very closely allied with the Partin Mfg. Co., the latter being practically the sales organization for Partin-Palmer cars. The liabilities of the American company amount to more than \$125,000, and the assets, in the form of car parts, etc., to about \$15,000. The firm is of the opinion that a reorganization will straighten matters out and under such conditions there would be little difficulty, it is stated, in paying off all the indebtedness of the company.

Four New Buildings for Hupmobile

The Hupp Motor Car Co., Detroit, has started work on four new buildings, consisting of a new office building two stories high, 1,800 x 300; an engineering building, 200 x 200; a testing laboratory 350 x 200, and a top and body building 1,500 x 300. The men employed in the erection work are in the direct employ of the Hupp company.

Detroit Steel Products Convention

The annual sales convention of the Detroit Steel Products Co. was held last week and officials of the company announced that during 1914 the business of the concern had increased 33 per cent. Fifty members of the sales organization and officials of the company took part in the banquet that was given at the Hotel Cadillac February 4 and which was presided over by General Sales Manager Paul Smith.

Kelly-Springfield Income Increases

During the past year, the Kelly-Springfield Tire Co., New York, made a net increase in income of more than 100 per cent. The gross profit for the year increased \$939,194, the net income being \$1,215,143. During 1913, the income was but \$559,543, according to the annual report which is about to be published. It is stated that liberal reserves have been made for bad and doubtful accounts receivable and that the inventories of merchandise and materials which increased by \$563,757 during the year have been priced at cost with crude rubber at less than the market prices prevailing at the end of the year. Out of the earnings a sinking fund of 2 per cent has been set aside for dividends on the 6 per cent preferred stock.

MORE TIRE MAKERS PARE LISTS TO NEW LEVELS

General Reduction Following Goodrich
Revision Affects Plain and Non-Skid
Treads and Tubes—New Adjust-
ment on Kelly-Springfields

The tire situation is clarifying itself and in the process tire lists quite generally are touching new low levels. Since the Goodrich company announced its new list and the abolishment of percentage discounts in favor of established list prices to the user and net prices to the dealer, half a dozen other makers have revised lists and in practically every case the new figures are lower than the old ones.

In the majority of cases, manufacturers have not as yet made definite decision with regard to revisions, though it is admitted that these are being considered. Among those who are considering this are Swinehart, Thermoid, Empire, which reports that it probably will meet the general reduction, and Lee.

The reductions which have been announced are substantial in every case, as is revealed by the accompanying table, and they apply not only to plain treads but to non-skid treads and to tubes as well. Although the reductions which have been made apply in nearly every case to all sizes, in at least one case a reduction has been made only in casings 4 inches in diameter and over, no change being made in tube prices. This is the Kelly-Springfield company, which has reduced 4-inch casings 10 per cent and 4½ and over casings 12½ per cent. At the same time, an important readjustment of mileage guarantee has been made, which is best explained in the company's own words:

"We are going to allow our dealers and distributors to increase the adjustment feature on our tires to 6,000 miles on plain tread and to 7,000 on our Kant

Slip tire, in the Ford sizes. We will adjust on a basis of 5,000 miles for all plain tread tires 4 inches and above; and 6,000 miles on the Kant Slip type."

The companies which have as yet made no announcement include Batavia, Federal, Miller, Falls, Republic and some others.

PROMINENT MEN WHO ASSUME NEW DUTIES

C. E. Poyer has been appointed assistant sales manager of the Edison Storage Battery Co.

D. W. Chamberlain has been appointed manager of the Cleveland branch of the Kelly-Springfield Tire Co.

C. W. Findeisen has been appointed general sales manager for the Findeisen & Kropf Mfg. Co., Chicago.

Capt. M. S. Thompson has been appointed manager of the truck sales and service department of the Velie Motor Car Co., Cleveland.

F. F. Beall, who has been factory manager of the Packard Motor Car Co., Detroit, has been promoted to vice-president in charge of manufacturing.

Winfield S. Williams has been appointed manager of the Dallas, Tex., branch of the Studebaker Corp. in place of C. W. Hartman, who has resigned.

K. W. Nadjer has been appointed Detroit representative of the Cotta Transmission Co., Rockford, Ill. His headquarters will be in the Chamber of Commerce building.

C. C. Hanch will give up his active connection with Nordyke & Marmon Co. March 1 to accept an important post in the executive organization of the Studebaker Corp., South Bend.

B. W. Collins has become sales manager of the Campbell, Wyant & Cannon Foundry Co., Muskegon. He was formerly with the Lozier Motor Co., Detroit, as assistant to the president.

Geo. E. Seidel, president of the Pilot

ceeded to the duties of treasurer and general manager formerly performed by T. H. Hill, who has severed his connection with the company.

Geo. F. Heising, who has been with the Moon Motor Car Co., St. Louis, for a long time and was formerly chief engineer and later purchasing agent, succeeds L. F. Goodspeed, who left the services of the Moon company February 1.

W. E. Anderson, who has for many years been connected with several of the large rubber companies, is now district manager of the Dayton Rubber Mfg. Co., Dayton, O. His headquarters are 2011 Michigan avenue, Chicago, and he will appoint dealers in this territory.

Twombly May Be Reorganized

F. W. Stelle has been appointed receiver for the Twombly Car Corp., with the power to continue business or to close up any of the establishments of the company. The appointment was made on application of D. Stuart Dodge, president and financial backer of the company. Dodge has advanced \$114,439 to provide funds for pay rolls and other expenses. He is the largest creditor. Outside of his claim, which amounts to \$468,238, the liabilities will not exceed \$10,000, to about seventy creditors. The tangible assets, it is asserted, do not exceed \$35,000, aside from the patents and interests in contracts with W. I. Twombly, the inventor, which are of uncertain value. It is expected that a new company will be reorganized with new capital.

Hinman's Measure Passes the Senate

Having passed the House of Representatives, as reported in Motor World last week, Representative Hinman's bill to abolish the office of New York State Fire Marshall has also passed the Senate. It will now come before Governor Whitman and it is confidently expected that he will sign it.

TABULATION GIVING OLD AND NEW PRICES IN TIRE LISTS WHICH HAVE BEEN REVISED

Name		30 x 3		32 x 3½		34 x 4		36 x 4½	
		Old	New	Old	New	Old	New	Old	New
Braender	Plain	\$11.70	\$9.00	\$16.75	\$13.35	\$24.35	\$19.40	\$35.00	\$27.35
	Non-skid	14.05	10.35	22.10	15.35	29.20	22.30	42.00	31.45
	Tube	2.80	2.35	3.70	2.80	4.90	4.00	6.45	5.20
Firestone	Plain	12.30	9.40	17.60	13.75	26.20	19.90	36.75	28.70
	Non-skid	14.60	10.55	21.20	15.40	30.50	23.30	41.90	32.15
	Tube	2.80	2.20	3.70	2.70	4.90	3.90	6.45	5.00
Fisk	Plain	12.30	9.00	17.65	13.35	25.65	19.40	36.85	27.35
	Non-skid	13.30	9.45	19.05	14.00	27.40	20.35	39.05	28.70
	Tube	2.95	2.35	3.90	2.80	5.15	4.00	6.80	5.20
United States	Plain	11.70	9.00	16.75	13.35	24.35	19.40	35.00	27.35
	Chain Tread	14.05	10.70	20.10	16.00	29.20	23.95	42.00	32.85
	Tube	2.80	1.85	3.70	2.80	4.90	4.00	6.45	5.20
Goodyear	Plain	11.70	9.35	16.75	13.95	24.35	20.35	35.00	28.70
	Non-skid	13.70	10.95	19.60	16.30	28.50	23.80	40.95	33.60
	Tube	2.50	2.35	3.70	2.80	4.90	4.00	6.45	5.20
Kelly-Springfield	Plain	15.20	15.20	21.20	21.20	30.50	27.45	39.77	35.80
	Non-skid	18.10	18.10	25.30	25.30	36.90	33.55	46.57	41.40
	Tube	3.20	3.20	4.40	4.40	5.65	5.65	7.50	7.50
Ajax	Plain	12.65	9.60	...	...	26.30	20.65	37.85	29.10
Pennsylvania	Plain	10.80	9.40	...	...	22.90	20.35	32.15	28.70
	Vacuum Cup	14.40	13.00	...	...	34.00	28.95	46.35	38.55

CARBURETER LITIGATION IS BROUGHT TO A HALT

**Zenith Wins on One Model Now Being
Produced and Loses on Two Others
Discontinued—Stromberg Likely
Will Appeal**

Judge Sanborn in the United States district court for the Northern district of Illinois decided February 3 the suit of the Stromberg Motor Devices Co., Chicago, against the Zenith Carbureter Co., Detroit, in favor of the Zenith company in regard to one model now being manufactured and against the Detroit concern with reference to two discontinued models. The Ahara, Richard, Sturtevant and Anderson patents are the ones upon which the complainant based the present suit. This decision is made after a lapse of about eight months, the testimony having been taken in May, 1914.

The case involved four carbureter patents, two of which, the Ahara and Richard, were claimed to be infringed by previous Zenith types in the suit of the Stromberg company against the John A. Bender Co., Chicago, agent for Keeton cars, which were equipped with Zenith devices.

The Bender case was decided in February, 1914, in favor of the Stromberg company. The Stromberg attorney attempted to convince the court that the Zenith company was a party in the suit for the reason it supplied fees and lawyers to conduct the defense. Bender declined to appeal, dropped the Zenith lawyers, engaged his own and dismissed the appeal. This brought the Stromberg company face to face with the question of bringing suit against the Zenith company, the latter having issued a legal battle in May, 1914. The decision today was the result. But since the time of the Bender case the Zenith company has discontinued two types of carbureters which are said to infringe and is manufacturing and selling one type which is declared by Judge Sanborn to be free of infringement. So the presiding judge in his decision states:

"If the Zenith does not infringe any of the complainant's patents in its main operation, as I think it does not, it should not be held to infringe in a minor operation not clearly disclosed by any of such patents. Infringement is, at least, doubtful and should not be decreed. As no infringement appears by the No. 2 carbureter, no injunction should issue, but there should be a decree to the effect that the Ahara and Richard patents were infringed by the manufacture and sale of carbureters like Nos. 1 and 10 and for an accounting and damage without costs to either party."

The No. 2 carbureter is the one now being made and sold by Zenith; No. 1 and 10 are the discontinued types.

It follows that the Stromberg company can collect royalty on the carbureters called No. 1 and No. 10 which have been discontinued by the Zenith company but which were being made when the Bender suit was on. The three carbureters in question have manufacturing dates as follows: No. 1, made between August, 1911, and August, 1912; No. 10, made in March, 1912, and shortly afterwards discontinued, and No. 2, made between March, 1913, and April, 1914, and being made at the present time.

In the present case Judge Sanborn in his decision likens the suit to the previous one against Bender, saying: "In the Bender suit the decision turned on the distinction between suction-controlled and gravity-controlled nozzles, and in-

fringement was found because it was thought the Zenith device there shown like Ahara was not gravity controlled in the secondary nozzle." . . . "So the matter practically comes down to the question whether carbureters with two 3/16-inch vents said to create no vacuum at all in the U-tube, should be held to infringe."

Judge Sanborn evidently came to the conclusion cited above, because he says: "The Bender decision went upon the theory that a 1/8-inch hole in the Zenith well would so restrict the U-tube as to create a vacuum therein and so operate just like the Ahara. The vents having now been enlarged so there is no sub-atmosphere (vacuum) in the well, the Ahara patent is not infringed."

The Richard patent, being an improvement of the Ahara, the judge similarly decreed that it was not infringed by the Zenith carbureter now being made.

In commenting on the validity of the Sturtevant patent, Judge Sanborn said: "Sturtevant is clearly valid, but I do not think it infringed."

Relative to the Anderson patent the judge continued: "With all these differences (four were named in the decision) in means, operation and result, particularly in operation and construction, infringement is so doubtful that it should not be decreed."

The patents involved in this case are numbered as follows: Ahara, 684,662; Richards, 791,501; Sturtevant re-issue, 12,611, and Anderson, 1,063,148.

The Ahara and Richard are somewhat the same, the latter being an improvement of the Ahara. This is known as the atmospheric well type, that is, a type of carbureter in which the proper mixture is maintained at the various engine speeds by means of an auxiliary supply of fuel from a well which communicates with the atmosphere and which is fed from the constant level fuel chamber or float chamber.

The Sturtevant patent relates to a combination of two distinct mixers, the main one for ordinary use and the other for low-speed and being in operation also when the other is working. The Anderson patent relates to the Stromberg Model E, which has not been pushed extensively.

As the case stands, the Stromberg company may collect on the two discontinued but infringing carbureters and appeal on errors in the case just decided. In all probability an appeal will be made.

Motor Car Securities Quotations

	Feb. 6, 1914	Feb. 6, 1915
	Bid	Asked
Ajax-Grieb Rubber Co., com.	200	280
Ajax-Grieb Rubber Co., pfd.	98	101
Aluminum Castings, pfd.	97	100
Chalmers Motor Co., com.	90	94
Chalmers Motor Co., pfd.	92 1/4	93 1/4
Firestone Tire & Rubber Co., com.	240	370
Firestone Tire & Rubber Co., pfd.	107	108
General Motors Co., com.	53	56 1/4
General Motors Co., pfd.	89	94 1/4
B. F. Goodrich Co., com.	25	25 1/4
B. F. Goodrich Co., pfd.	90	92 1/4
Goodyear Tire & Rubber Co., com.	215	225
Goodyear Tire & Rubber Co., pfd.	98	100
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	5	5
International Motor Co., pfd.	15	15
Kelly-Springfield Tire Co., com.	104	105
Kelly-Springfield Tire Co., 1st pfd.	82	83
Kelly-Springfield Tire Co., 2nd pfd.	115	117
Maxwell Motor Co., com.	5	5 1/4
Maxwell Motor Co., 1st pfd.	28	29
Maxwell Motor Co., 2nd pfd.	9 1/4	10
Miller Rubber Co., com.	158	165
Miller Rubber Co., pfd.	101	103
Packard Motor Car Co., com.	100	100
Packard Motor Car Co., pfd.	95	98 1/4
Peerless Motor Car Co., com.	15	25
Peerless Motor Car Co., pfd.	75	80
Portage Rubber Co., com.	40	30
Portage Rubber Co., pfd.	90	85
Reo Motor Truck Co.	7 1/4	11 1/4
Reo Motor Car Co.	17 1/4	21 1/4
Stewart-Warner Speed Corp., com.	54	56
Stewart-Warner Speed Corp., pfd.	98	100
Studebaker Corp., com.	29	30
Studebaker Corp., pfd.	87 1/4	87 1/4
Swinehart Tire & Rubber Co.	69	71
U. S. Rubber Co., com.	59	59 1/4
U. S. Rubber Co., pfd.	101 1/4	102 1/4
White Co., pfd.	105	110
Willis-Overland Co., com.	65	67
Willis-Overland Co., pfd.	91	95

NEW HAMPSHIRE DEALERS PLANNING ORGANIZATION

**Temporary Association of Motor Car
and Accessory Men Already Formed
—Eventually Will Take in the
Entire State**

New Hampshire motor car and accessory dealers have started a movement to organize. There is a temporary association now formed, and before it is fully established it will take in the entire state if the plans of those behind it are worked out.

The meeting brought together 62 men prominent in the motor world of New Hampshire, representing various cities. W. R. Bliss, New England manager of the Goodyear Tire & Rubber Co. of Boston, and President George P. Brophy of the Boston Automobile Accessory Association were the principal speakers and they dwelt upon the value of organization.

Among the other speakers were R. N. Robertson, Toledo, O., and R. C. Boardman, of Boston. An advisory committee was formed to whip the organization into shape. It includes: F. L. Johnson, Concord; Raymond Thompson, Concord; B. M. Prescott, Jr., Franklin; George Page, Laconia; A. C. Pollard and N. J. Paquette, of Nashua; William H. Saxton, G. White Van Auker, Edward Gould, Harry D. Bourne, Walter Underwood and Howard Lamprey, all the last six of Manchester.

As Portsmouth already has a dealers' organization and plans are under way to organize in other cities it will be an easy matter to form a state organization. Dealers in cities like Keene, Dover, Portsmouth, Rochester, Berlin, Plymouth and Lancaster will be given invitations to join.

Not only will the organization stand for reputable dealing, but it will also work for better legislation and to prevent bills like the truck measure now agitated from becoming law, this bill being somewhat drastic.

To Manufacture Magneto Parts

Alexander S. Hecht, doing business as Hechts Magneto Exchange, New York, has formed the Magneto Parts Co., Inc., to manufacture and distribute parts for all standard magnetos. Associated with Hecht is E. M. Lowe, secretary-treasurer of the new company.

Titan Battery Now General Lead

The Titan Storage Battery Co., Newark, N. J., has changed its name to General Lead Batteries Co. No change whatever in ownership, officers or policy is involved. The change is made entirely to avoid confusion.

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

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Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KBIT											
O	4-3/4x4	Disco	Johnson	Disco	Disk	3 108	32x3 1/2	850	850	....	....
M	4-3/4x4	Bosch	Stmbg	N E	Disk	3 108	32x3 1/2	965	965	....	....
LAMBERT											
48-C	4-3/4x4	Brggs	Shblr	Brggs	....	113	32x3 1/2	....	1,200	....	....
68-C	4-4 1/2x5 1/2	Brggs	Shblr	Brggs	....	117	34x3 1/2	1,565	1,565	....	....
LENOX											
Four	4-4 1/2x5 1/2	Waths	Own	Waths	Cone	3 118	34x4 1/2	....	2,000	....	....
81x	6-3/4x5 1/2	Waths	Own	Waths	Cone	3 130	34x4 1/2	....	2,485	....	....
LEWIS											
...	6-3/4x6	Brggs	Stmbg	Remy	Disk	3 135	36x4	1,000	1,000	....	....
LEXINGTON											
Four	4-3/4x5 1/2	Waths	Shblr	Waths	Disk	3 115	34x4	1,375	1,375	....	....
6-L	6-3/4x5	Waths	Shblr	Waths	Disk	3 128	34x4	1,875	1,875	....	....
6-M	6-4 1/2x5	A. Kent	Stmbg	Jeeco	Cone	3 130	34x4 1/2	2,575	2,575	2,675	....
LOCOMOBILE											
M-5	6-4 1/2x5 1/2	Bosch	Own	Waths	Disk	4 140	37x5	5,100	....	5,100	....
R-5	6-4 1/2x5	Bosch	Own	Waths	Disk	4 132	37x5 1/2	4,400	4,400	....	....
LUVERNE											
700	6-4 x5	Bosch	Shblr	Jeeco	Disk	3 128	36x4 1/2	....	....	2,500	....
LYONS-KNIGHT											
K-4	4-4 1/2x5 1/2	Simms	Stmbg	N E	Disk	3 130	37x5	....	2,900	2,900	....
MARION											
...	8-3/4x4 1/2	Bosch	....	G & D	Disk	3 115	34x4	1,500	1,500	....	....
...	6-3 x5	Bosch	....	G & D	Disk	3 122	34x4	....	1,350	....	....
...	6-3x5	Bosch	....	G & D	Disk	3 115	34x4	....	1,250	....	....
MARMON											
41	6-4 1/2x5 1/2	Bosch	Stmbg	Bosch	Cone	3 132 1/2	36x4 1/2	3,250	3,250	3,350	....
48	6-4 1/2x6	Bosch	Zenith	Roth	Disk	3 145	37x5 1/2	....	....	5,000	....
MAXWELL											
25	4-3/4x4 1/2	Simms	Kingstn	Simms	Cone	3 103	36x3 1/2	725	750	....	....
McFARLAN											
T	6-4 x6	Waths	Stmbg	Waths	Cone	3 132	36x4 1/2	2,500	2,500	2,500	....
X	6-4 1/2x6	Waths	Stmbg	Waths	Cone	3 132	36x4 1/2	2,900	2,900	2,900	....
McINTYRE											
25	4-3/4x5 1/2	Bosch	Stmbg	G & D	Cone	3 106	32x3 1/2	....	850	....	....
6-40	6-3/4x4 1/2	Brggs	Stmbg	Brggs	Disk	3 130	35x4	....	1,275	....	....
MERCER											
Spdstr	4-3/4x6 1/2	Bosch	Zenith	U.S.L.	Disk	4 130	34x4 1/2	2,750	....	....	....
Edstr	4-3/4x6 1/2	Bosch	Zenith	U.S.L.	Disk	4 130	34x4 1/2	....	3,000	....	....
METBOR											
42	4-4 x5	A. Kent	Stmbg	Spdfr	Disk	3 114	34x4	....	1,075	....	....
45	6-3x5	A. Kent	Stmbg	Spdfr	Disk	3 126	35x4	....	1,395	....	....
METZ											
22	4-3/4x4	Bosch	Own	G & D	....	96	30x3	495	....	....	....
25	4-3/4x4	....	A.W.T.	G & D	....	105	32x3 1/2	....	600	....	....
MITCHELL											
Four	4-4 x5 1/2	Conn	....	Spdfr	Cone	3 116	34x4	1,250	1,350	....	....
81x	6-4 x5 1/2	Conn	....	Spdfr	Cone	3 128	36x4	1,585	1,585	....	....
7-6	6-4 1/2x7	Remy	....	Bemy	Cone	3 144	37x5	....	....	2,350	....
5-6	6-4 1/2x6	Remy	....	Remy	Cone	3 132	36x4 1/2	1,895	1,895	....	....
MOLINE-KNIGHT											
...	4-4 x6	Bosch	Shblr	Wgner	Cone	4 128	36x4 1/2	2,500	2,500	2,500	....
40	4-3 1/2x5	Conn	....	....	Cone	3 114	31x4	....	1,475	....	....
MONARCH											
81x	6-3 1/2x5	A. Kent	Zenith	W. Lard	Cone	3 125	33x4	....	1,250	1,275	....
MONROE											
M-2	4-3 x3 1/2	Conn	Zenith	A-Lite	Cone	3 96	30x3	400	....	....	....
MOON											
4-38	4-3/4x5	Delco	Rafid	Delco	Disk	3 122	34x4	1,350	1,350	....	....
6-40	6-3/4x5	Delco	Rafid	Delco	Disk	3 122	34x4	1,575	....	....	....
6-50	6-3/4x5 1/2	Delco	Rafid	Delco	Disk	4 130	35x4 1/2	2,150	....	....	....
MORSE											
D	4-4 1/2x5	Elsmn	Stmbg	G & D	Disk	4 127	36x4 1/2	3,600	3,600	3,600	....
NATIONAL											
AB	6-3/4x5 1/2	Elsmn	Rafid	Waths	Cone	3 134	36x4 1/2	2,375	2,375	....	....
NORWALK											
F	6-3/4x5 1/2	A. Kent	Rafid	G & D	Disk	4 131	37x4	1,875	....	....	....
OAKLAND											
37	4-3/4x5	Delco	Marvel	Delco	Cone	3 112	33x4	1,150	1,200	....	....
49	6-3/4x5	Delco	Johnson	Delco	Cone	3 123 1/2	35x4 1/2	....	1,685	....	....
Spdstr	4-3/4x5	Delco	Marvel	Delco	Cone	3 113	33x4	1,100	....	....	....
OGREN											
81x	6-3/4x5 1/2	Bosch	Rafid	B-Rahmr	....	3	....	....	....	2,500	....
OLDSMOBILE											
42	4-3/4x5	Delco	Marvel	Delco	Cone	3 112	33x4	1,285	1,285	....	....
55	6-4 1/2x5 1/2	Delco	Marvel	Delco	Cone	3 139	36x5	....	....	2,975	....
OVERLAND											
80	4-4 1/2x4 1/2	Bosch	Shblr	A-Lite	Cone	3 114	34x4	1,050	1,075	....	....
81	4-4 x4 1/2	Spdfr	Shblr	A-Lite	Cone	3 106	33x4	795	850	....	....
83	6-3/4x5 1/2	Bosch	Shblr	A-Lite	Cone	3 125	35x4 1/2	....	....	1,475	....
OWEN											
...	6-3/4x5 1/2	Owen	Master	O.M.	O.M.	136	35x5	3,750	....	3,750	....
PACKARD											
3-38	6-4 x5 1/2	Bosch	Own	Bljur	Plate	3 140	37x5 1/2	3,750	3,750	2,850	....
5-48	6-4 1/2x5 1/2	Bosch	Own	Bljur	Plate	3 144	37x5	4,750	4,750	4,850	....
PAIGE											
81x	6-3/4x5 1/2	Bosch	Rafid	G & D	Disk	3 124	34x4	1,395	....	1,395	....
36	4-4 x5	Bosch	Stwrt	G & D	Disk	3 116	34x4	1,075	1,075	....	....
PARTIN-PALMER											
20	4-3/4x4	A. Kent	Muir	G & D	Disk	3 96	28x3	495	....	....	....
38	4-3/4x5 1/2	A. Kent	Stmbg	G & D	Cone	3 115	33x4	....	....	....	....
PATERSON											
4-32	4-3/4x5	Delco	Stmbg	Delco	Cone	3 112	33x4	....	1,005	....	....
6-48	6-3/4x5	Delco	Stmbg	Delco	Cone	3 124	34x4	....	1,495	....	....
PATHFINDER											
...	6-3/4x5 1/2	Waths	Shblr	Waths	Disk	4 125	34x4 1/2	2,323	....	2,323	....

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PEERLESS											
54	4-3/4x5	A. Kent	Stmbyg	G & D	Disk	3 113	34x4	2,000	2,000	....	....
55	6-3/4x5	A. Kent	Stmbyg	G & D	Disk	3 121	34x4	2,320	2,320	....	....
48-6	6-4 1/2x6	Bosch	Own	G & D	Band	4 137	37x5	4,900	....	5,900	....
PETER PAN											
3-E	4-2 1/4x4 1/2	Bring	.....	.....	Disk	3 110	28x3 1/2	650	....	....	....
PIERCE-ARROW											
C-3	6-4 x5 1/2	Bosch	Own	Waths	Cone	4 134	36x4 1/2	4,300	4,300	....	....
B-3	6-4 1/2x5 1/2	Bosch	Own	Waths	Cone	4 142	37x5	4,900	4,900	5,000	....
A-3	6-5 x7	Bosch	Own	Waths	Cone	4 147 1/2	38x5 1/2	5,900	5,900	6,000	....
PILOT											
55	6-3/4x5 1/2	Waths	Shblr	Waths	Cone	3 125	34x4	1,835	1,835	1,845	....
75	6-4 1/2x6	Waths	Ctr	Waths	Cone	3 123	37x4 1/2	2,885	2,885	2,885	....
PREMIER											
6-50	6-4 x5 1/2	Elsmn	Rafid	Remy	Disk	3 132	36x4 1/2	1,985	1,985	1,985	....
PRATT											
6-50	6-3/4x5 1/2	A. Kent	Rafid	G & D	Disk	4 123	37x4 1/2	2,150	2,150	2,250	....
PULLMAN											
Jr	4-3/4x4 1/2	Spldf	Stmbyg	Spldf	Disk	3 110	30x3 1/2	740	740	....	....
6-48	6-3/4x5 1/2	Simms	Stmbyg	Waths	Disk	4 134	36x4 1/2	2,500	2,500	2,500	....
RAYFIELD											
20	4-2 1/4x4 1/2	.....	Own	.....	Disk	3 96	28x3	....	305	....	....
R-C-H											
K	4-3/4x5	Bosch	B-D	W. Lard	Cone	3 110	32x3 1/2	....	775	....	....
REGAL											
D	4-3/4x5	A. Kent	Stwrt	Bosch	Cone	3 112	33x4	1,065	1,065	....	....
...	8-3/4x4 1/2	.....	Stwrt	H. Rahmr	....	112	33x4	1,250	1,250	....	....
...	4-3/4x3 1/2	.....	.....	Spldf	....	3 106	30x3 1/2	650	650	....	....
REMINGTON											
...	4-3/4x4	A. Kent	.....	W. Lard	Cone	2 106	30x3 1/2	695	695	....	....
Ghd	8-3/4x4 1/2	A. Kent	Zenith	G & D	Disk	3 116	35x4 1/2	1,495	....	....	....
REPUBLIC											
E	6-4 1/2x5	Delco	Rafid	Delco	Cone	4 133	36x4 1/2	....	2,950	2,950	....
REO											
M	6-3 9-16x5 1/2	Remy	Johnson	Remy	Disk	3 122	34x4	....	1,395	....	....
ST	4-4 1/2x4 1/2	Natnl	Holley	Natnl	Disk	3 112	34x4	1,000	....	....	....
R	4-4 1/2x4 1/2	Remy	Holley	Remy	Disk	3 115	34x4	....	1,000	....	....
REOS											
...	8-3 x4 1/2	.....	.....	Own	Diak	3 115	34x4	....	1,350	....	....
SAXON											
A	4-2 1/4x4	A. Kent	Mayer	.....	Plate	2 96	28x3	395	....	....	....
B2	6-2 1/2x4 1/2	A. Kent	.....	G & D	Disk	3 112	32x3 1/2	....	785	....	....
SCRIPPS-ROOTH											
C	4-2 1/4x4	A. Kent	Zenith	Bifur	Cone	3 110	30x3 1/2	775	....	....	....
SPAULDING											
H	4-4 1/2x5 1/2	Simms	Rafid	Entz	Cone	3 129	36x4	....	1,060	....	....
S. G. V. J.											
Jr	4-3/4x4 1/2	Bosch	Zenith	W. Lard	Disk	4 118	34x4	3,300	3,300	....	....
SIMPLEX											
38	4-4 1/2x6 1/2	Bosch	Nwcmh	Bosch	Disk	4 137	37x5 1/2	All bodies to order	All bodies to order	....	....
50	4-5 1/2x6 1/2	Bosch	Nwcmh	Bosch	Disk	4 137	37x5 1/2	All bodies to order	All bodies to order	....	....
SINGER											
Six	6-4 x5 1/2	Elsmn	C B G	Waths	Diak	4 135	36x4 1/2	2,300	2,350	....	....
SPEEDWELL											
I	6-4 1/2x5 1/2	Waths	Shblr	Waths	Disk	3 125	37x5	....	....	2,950	....
SPIRIT											
A-15	4-2 1/2x5	Spldf	Mayer	Spldf	Cone	3 112	30x3 1/2	....	695	....	....
STEARNS											
L-4	4-3/4x5 1/2	Bosch	Shblr	G & D	Cone	3 119	34x4	1,750	1,750	....	....
S-K-4	4-4 1/2x5 1/2	Bosch	Stmbyg	G & D	Disk	3 127	36x4 1/2	2,750	2,750	2,900	....
S-K-6	4-4 1/2x5 1/2	Bosch	Stmbyg	G & D	Disk	4 134	37x5	4,950	4,950	5,000	....
STUDEBAKER											
4-SD	4-3/4x5	Remy	Shblr	Wagner	Cone	3 108	33x4	985	985	....	....
6-E.C.	6-3/4x5	Remy	Shblr	Wagner	Cone	3 121	34x4	....	1,385	1,450	....
STUTZ											
H.C.S	4-3/4x5	Remy	Stmbyg	Remy	Cone	3 106	32x4	1,475	....	....	....
Br. Cat.	4-4 1/2x5 1/2	Bosch	Stmbyg	Remy	Cone	3 120	34x4 1/2	2,000	....	....	....
Six	6-4 x5	Elsmn	Stmbyg	Remy	Cone	3 130	34x4 1/2	2,125	....	....	....
T. Car	4-4 1/2x5 1/2	Bosch	Stmbyg	Remy	Cone	3 130	34x4 1/2	....	2,275	....	....
T. Car	6-4 x5	Elsmn	Stmbyg	Remy	Cone	3 130	34x4 1/2	....	2,400	....	....
TOURNAINE											
12	6-4 x5 1/2	Simms	Zenith	Waths	Diak	4 134	34x4 1/2	3,150	3,150	3,350	....
TRUMBULL											
15-AB	4-2 1/4x4	Spldf	Brze	W. Lard	Cone	3 96	28x3	395	....	....	....
TWOBLY											
...	4-3/4x4	Spldf	Zephyr	Undec	Cone	3 100	30x3	600	750	....	....
VELIE											
4-45	4-4 1/2x5 1/2	Bosch	Stmbyg	G & D	Disk	4 121	37x4 1/2	1,750	1,750	....	....
6-50	6-3/4x5 1/2	Bosch	Stmbyg	G & D	Disk	4 136	37x4 1/2	2,615	2,615	....	....
Bltwl	6-3/4x5	A. Kent	Stmbyg	G & D	Disk	4 134	34x4	1,595	1,595	....	....
VIXEN											
8-B	4-2 1/4x4	A. Kent	Zephyr	.....	....	106	28x3	395	....	....	....
VULCAN											
...	4-3/4x5 1/2	Waths	.....	Waths	Disk	3 120	32x3 1/2	975	975	....	....
WESTCOTT											
O	4-3/4x5	Delco	.....	Delco	Cone	3 113	33x4	1,185	1,185	....	....
U	6-3/4x5	Delco	.....	Delco	Cone	3 125	34x4	....	1,585	....	....
WHITE											
30	4-3/4x5 1/2	Bosch	Own	Own	Plate	4 115	32x4	2,050	2,700	....	....
45	4-4 1/2x6 1/2	Bosch	Own	Own	Plate	4 133 1/2	36x4 1/2	....	....	2,800	....
60	6-4 1/2x5 1/2	Bosch	Own	Own	Plate	4 140 1/2	37x5	All bodies to order	All bodies to order	....	....
WILLYS-KNIGHT											
K-19	4-4 x5 1/2	Simms	Zenith	U.S.L	Cone	4 130	36x4 1/2	....	2,475	....	....
WINTON											
21	6-4 1/2x5 1/2	Bosch	Rafid	Air or Elec	Diak	4 136	37x5	3,350	3,350	3,500	....
21A	6-3/4x5 1/2	Bosch	Rafid	Air or Elec	Diak	4 128	36x4 1/2	2,285	2,285	....	....
WOODS MOBILETTE											
3	4-2 1/4x4	Manto	.....	.....	Cone	2 104	26x2 1/2	390	....	....	....

Motor Car Agencies Recently Established

PLEASURE CARS

OHIO

Place	Car	Dealer
Arla	Franklin	Stemple & Smith
Akron	Haynes	J. J. Stickles
Ashabula	Oldsmobile	Windermere-Euclid Car. Co.
Athens	Regal	J. S. McCarter
Bowling Green	Westcott	C. C. Richardson
Bucyrus	Empire	S. Hirtz & J. M. Smith
Canton	Regal	A. F. Holloway
Canton	Overland	The Canton Haynes Co.
Carey	Oldsmobile	Black & Black
Christianburg	Regal	Bright & Neal
Cincinnati	Briscoe	Citizens Motor Car Co.
Cincinnati	Maxwell	The Kruse Motor Car Co.
Cincinnati	Regal	Herold Motor Car Co.
Cincinnati	Grant	Eureka Auto Co.
Cincinnati	Princess	Hunter-Dammel Co.
Cincinnati	Franklin	The Franklin Motor Car Co.
Cincinnati	Allen	Kenton Motors Co.
Cincinnati	Lewis	Kenton Motors Co.
Cincinnati	Studebaker	The Imperial Motor Car Co.
Cincinnati	Pullman	G. L. Schlar
Cincinnati	Hupmobile	G. L. Schlar
Cincinnati	Cadillac	Noecker & Brehmen
Cincinnati	Oldsmobile	Princess
Cincinnati	Chalmers	J. H. Greenwald
Cincinnati	Allen	Stark Auto Co. Inc.
Cincinnati	Oakland	Oakland Motor Co.
Cincinnati	Pullman	M. D. Coate
Cincinnati	Oldsmobile	Windermere-Euclid Car. Co.
Cincinnati	Detroit	M. D. Coate
Cincinnati	Studebaker	A. R. Davis
Cincinnati	Allen	The Stark Motor Car Co.
Cincinnati	Kissel	Brandt Motor Car Co.
Cincinnati	Hupmobile	Cleveland Motor Sales Co.
Cincinnati	Midway	Electric Standard Motor Car Co.
Cincinnati	Jeffery	Capital Motor Car Co.
Cincinnati	Monarch	Monarch Motor Sales Co.
Cincinnati	Kissel	C. G. McCune
Cincinnati	Argo	Auto Inn & Exchange
Cincinnati	Saxon	G. J. Beck & Son
Cincinnati	Oldsmobile	E. F. Conrad
Cincinnati	Ford	Dayton & Troy Automobile Co.
Cincinnati	Regal	Griffith & Cone
Cincinnati	Oldsmobile	L. H. Carpenter
Cincinnati	Oldsmobile	Mox Motor Co.
Cincinnati	Haynes	City Auto Co.
Cincinnati	E. Palestine	M. E. Newbauer
Cincinnati	Elyria	Elyria Garage Co.
Cincinnati	Haynes	Castle's Garage
Cincinnati	Overland	Palace Garage
Cincinnati	Haynes	W. E. Brown
Cincinnati	Regal	R. C. McClelland
Cincinnati	Regal	E. Emmelhainz
Cincinnati	Maxwell	Hillshoro Motor Car Co.
Cincinnati	Regal	Guy Car
Cincinnati	Oldsmobile	Windermere-Euclid Car. Co.
Cincinnati	Westcott	Dallas Kirk
Cincinnati	Lewis	Shappell Bros
Cincinnati	Haynes	J. S. Case
Cincinnati	Regal	A. O. Hicks
Cincinnati	Regal	A. R. Pratt
Cincinnati	Marion	U. G. Lawrence & Son
Cincinnati	Maxwell	The Miller Garage
Cincinnati	Newark	J. E. Owens
Cincinnati	Seyville	I. M. Overholt
Cincinnati	Sidney	B. D. Heck
Cincinnati	Springfield	B. H. Brunton
Cincinnati	Toledo	H. Francke
Cincinnati	Toledo	Runnel Auto Sales Co.
Cincinnati	Toledo	Litchie Auto Co.
Cincinnati	Toledo	Standard Garage
Cincinnati	Wapakoneta	J. W. Elliott
Cincinnati	West Jefferson	W. H. Pence
Cincinnati	Williamsport	J. Schielek
Cincinnati	Xenia	M. H. Schmidt

OKLAHOMA

Bartlesville	Moon	R. G. Uhl & Son
Cordell	Kitt	C. H. Murdock
Cordell	Saxon	C. H. Murdock
Oklahoma City	King Eight	Stapleton Motor Sales Co.
Oklahoma City	Oldsmobile	Aeneas Motor Car Co.
Oklahoma City	Saxon	Fremont Motor Co.
Tulsa	Haynes	Oklahoma Auto Co.
Tulsa	Dodge Bros.	E. Westerman

OREGON

Portland	Chandler	Dulmage Manley Auto Co.
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PENNSYLVANIA

Beaver Falls	Herff-Brooks	G. S. Hunter
Chambersburg	Chandler	J. Kaufman
Cleatfield	Haynes	Wallace Garage
Curtisville	Kissel	N. M. Snyder
Hazleton	Haynes	Adam Aldam
Hazleton	Regal	Spruce St. Garage
Horsham	Westcott	T. W. Tyson
Larrobe	Oldsmobile	Rose & Steele
Mt. Union	Herff-Brooks	F. H. Culver
Philadelphia	Maxwell	Sterling Motor Car Co.
Philadelphia	Briscoe	The Gibson Auto Wks.
Philadelphia	Regal	Ideal Motor Car Co.
Pottsville	Haynes	Joseph Davenport
Saltsburg	Oldsmobile	J. W. Woodend
Santon	Regal	Conrad Bros.
Tamaqua	Haynes	Tamaqua Auto Car. & Rep. Co.

SOUTH DAKOTA

Aberdeen	Haynes	T. E. Payne
Deadwood	Oldsmobile	G. Kiker Car. & S. House
Emery	Haynes	J. P. Reighling
Hudson	Haynes	S. F. Hoffman

TENNESSEE

Knoxville	Franklin	Kohlman Motor Sales Co.
Nashville	Cadillac	Cadillac Sales Co. of Nashville

TEXAS

Corpuscular	Saxon	L. H. Lee
Dallas	Saxon	Saxon Sales Co.
El Paso	Chandler	Lane Star Motor Co.
Lockhart	Moon	E. H. Lipscomb

UTAH

Logan	Dodge Bros.	Blair Motor Co.
Logan	Ford	Kimball Auto Co.
Logan	Butler	Blair Motor Co.
Ogden	Cadillac	Cadillac Sales & Service Co.
Richmond	Oldsmobile	Bair Auto Co.
St. George	Oldsmobile	E. H. Snow
Salt Lake City	Metz	A. A. Sims

VERMONT

Place	Car	Dealer
Brandon	Herff-Brooks	F. R. Barker

VIRGINIA

Chilhowie	Oldsmobile	J. L. Vance & Co.
Eastville	Oldsmobile	Eastville Auto Co.
Staunton	Oldsmobile	J. H. Schultz

WASHINGTON

Cottonwood	Overland	O. D. Simmons
Fairbanks, Alaska	Hudson	Roy Rutherford
Lynden	Maxwell	A. A. Bauman
Malden	Maxwell	L. F. Rohleder
Rosale	Overland	Snyder & Fullerwood
Seattle	Pilot	Garage & Stratton
Seattle	Hudson	Northwest Motor Co.
Seattle	Oakland	Mack & Forsworth
Spokane	Reo	E. R. Fosdick
Stephane	Maxwell	T. A. Bennett
Tacoma	Dodge Bros.	Griffith Motor Co.
Tacoma	Studebaker	Cadillac Auto & S. Co.
Thorton	Hudson	G. F. Hodgson
Thorton	Maxwell	T. A. Bennett

Place	Car	Dealer
Walla Walla	Buick	T. S. Steele & Co.
Wilbur	Paige	T. F. Miller

WEST VIRGINIA

Wheeling	Dodge Bros.	H. S. Sands Elec. & Mfg. Co.
Marlinton	Haynes	C. H. Copenhaver

Recent Losses by Fire

Willimantic, Conn.—Nautchang garage; building and cars destroyed; estimated loss, \$25,000.

Willimantic, Conn.—Thread City garage; building and cars destroyed; estimated loss, \$25,000.

Harrisburg, Pa.—Ford garage and salesroom; building and 32 cars destroyed; estimated loss, \$40,000.

Feb. 15-20, Tacoma, Wash.—Show; A. L. Sommers, manager.

Feb. 15-20, Greensburg, Pa.—Westmoreland Auto Dealers Association show; Armory.

Feb. 15-20, Grand Rapids, Mich.—Automobile show. Klingman Furniture Exposition Building.

Feb. 15-20, Bridgeport, Conn.—Show; Armory.

Feb. 15-20, Omaha, Neb.—Show, Auditorium, C. G. Powell.

Feb. 16-18, Bloomington, Ill.—Show, Deere building.

Feb. 18-20, Racine, Wis.—Racine Auto Show Association show, Lakeside Auditorium.

Feb. 22-25, Allentown, Pa.—Show.

Feb. 22-27, Duluth, Minn.—Show.

Feb. 22-27, New Haven, Conn.—Automobile show, Second Regiment Armory. W. N. Lindsay, manager.

Feb. 22-27, South Bethlehem, Pa.—Automobile show; Coliseum; J. L. Elliott, manager.

Feb. 23-27, Ft. Dodge, Ia.—Automobile show, Armory.

Feb. 23-27, Syracuse, N. Y.—Automobile show, State Armory, Syracuse Automobile Dealers' Association.

Feb. 24-27, Indianapolis, Ind.—Fort Wayne Auto Trade Association show.

Feb. 24-27, Battle Creek, Mich.—Show, Rathburn & Kraft building; Messrs. Riley and Wattles.

Mar. 1-5, Wilkes-Barre, Pa.—Vehicle Trades Association show.

Mar. 1 to 5, Sioux Falls, So. Dak.—Automobile show, Auditorium.

Mar. 1-6, Utica, N. Y.—Automobile show; Automobile Club of Utica.

Mar. 2-9, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association show; 23rd Regiment Armory.

Mar. 4-6, Springfield, Mass.—Show, J. H. Graham, manager.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

Mar. 8-13, Indianapolis, Ind.—Annual Spring Opening, Indianapolis Auto Trade Association.

Mar. 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

Mar. 8-13, Canton, O.—Stark County Automobile Show and Electrical Exposition show, Auditorium.

Mar. 8-13, Utica, N. Y.—Utica Automobile Trade Association show.

March 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers Association. J. Clyde Myton, manager.

Mar. 22-27, Bangor, Wis.—Automobile show, Auditorium; A. P. Pierce, manager.

Coming Events

Feb. 22, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Feb. 25, New York, N. Y.—S. A. E. Metropolitan Section meeting; report of Research Committee on Kerosene Carbureters. Research Committee report on Non-Electric Continuous-Torque Transmission.

Feb. 27, San Francisco, Cal.—Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Mar. 3, Albany, N. Y.—Associated Garages of America, general convention.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.

Mar. 22-24, Chicago, Ill.—National Garage Owners' Association convention.

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.

June 9, Galesburg, Ill.—Two-mile track meet.

June 16, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Association.

June 25, Sioux City, Ia.—Track meet.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 20-21, Elgin, Ill.—Road race.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

July 4-5, Tacoma, Wash.—Speedway Races.

THE SHOW CIRCUIT

Feb. 8-11, Peoria, Ill.—Show, Coliseum.

Feb. 8-13, Salem, Mass.—Essex County Automobile Dealers' Association show, North Street Skating Rink; Clifford O. Shea, manager.

Feb. 8-13, Toledo, O.—Toledo Auto Shows Co., Terminal building; Hugo V. Buelow, manager.

Feb. 8-14, Kansas City, Mo.—Automobile show, Convention Hall.

Feb. 8-14, Troy, N. Y.—Troy Automobile Dealers' Association show.

Feb. 8-15, Wilmington, Del.—Show, Hotel Du Pont.

Feb. 9-12, Eau Claire, Wis.—Eau Claire Automobile Dealers' Association show.

Feb. 9-12, Peoria, Ill.—Peoria Auto & Motor Cycle Dealers' show.

Feb. 10-13, Davenport, Ia.—Show.

Feb. 15, Fort Wayne, Ind.—Fort Wayne Auto Trade Association show.

MOTOR WORLD

The Dealers' National Weekly

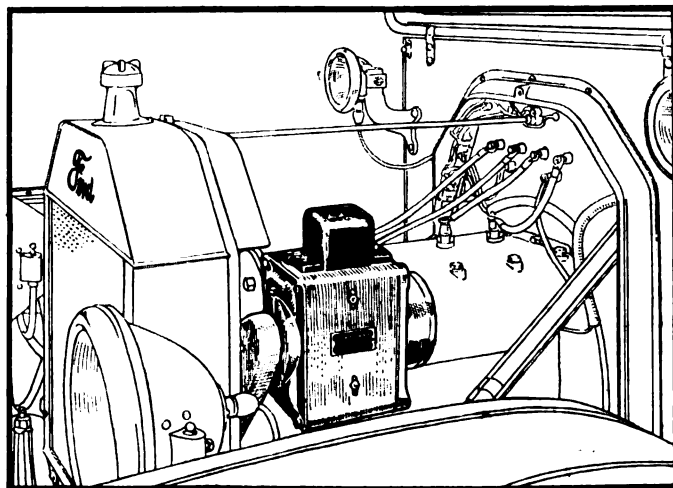
Volume XLII
No. 7

New York, February 17, 1915

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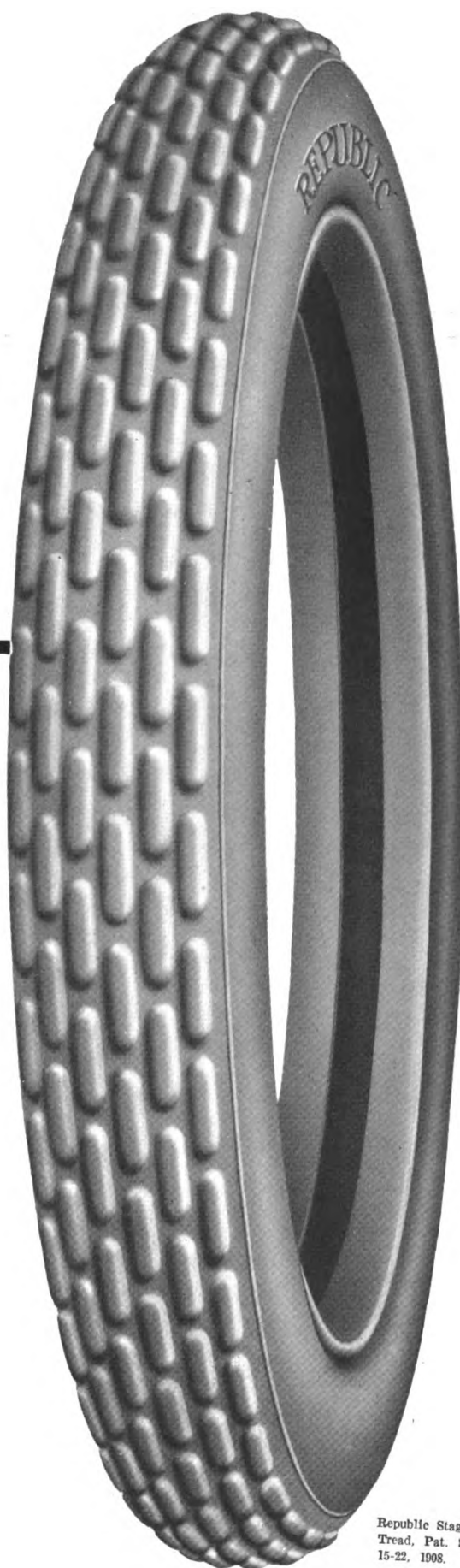
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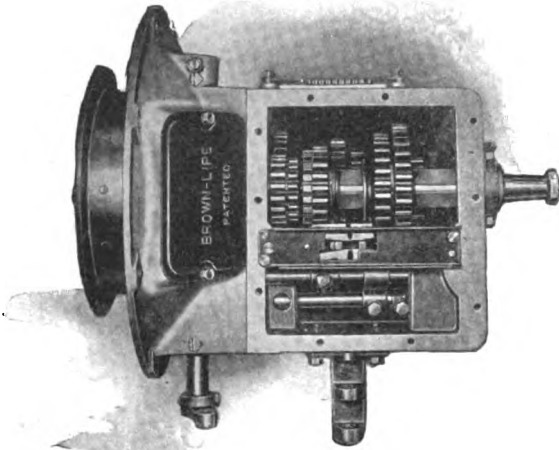
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Every experienced motorist knows that most punctures, so-called, are caused by faulty tubes rather than actual, accidental incision through the tire. Leakage around valves, porous rubber and worn spots are only a few of the unnecessary troubles common to cheap machine-made tubes.

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Unfilled orders were 26% greater than at the same time a year ago.

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MOTOR WORLD

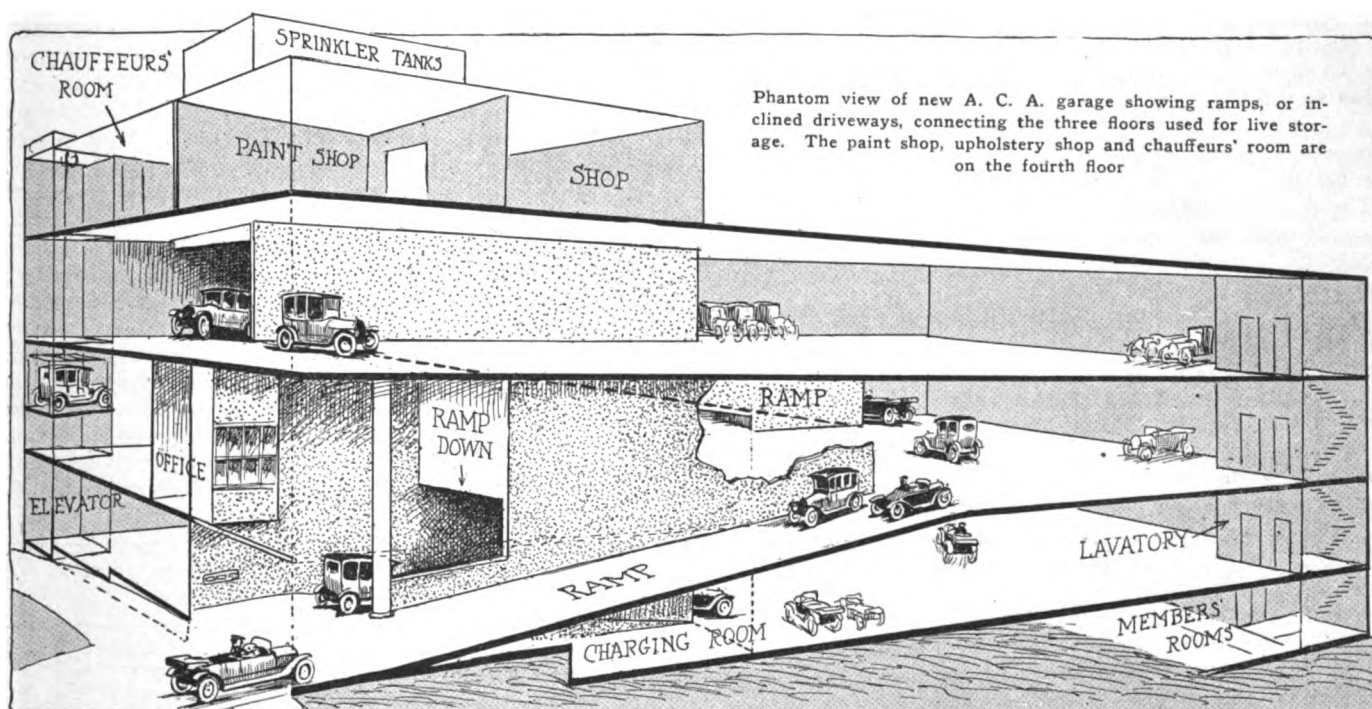
Vol. XLII

New York, U. S. A., Wednesday, February 17, 1915

No. 7

Ramps Take the Place of Six Elevators

Waiting and Expense of Elevator Operation Eliminated
Cars May Run From Street to Third Floor in 30 Seconds



TO move a motor car from in front of a four-story garage into position on the third floor in exactly 30 seconds may seem somewhat like a Herculean task, but it is not. It is a matter of everyday occurrence in the new garage of the Automobile Club of America in New York. And what may seem even more astonishing to the uninitiated is that another car may be coming down at the same time—and in practically the same time. Furthermore, immediately one car has commenced the journey to its abiding place, another may follow in its wheel tracks. All delay, all

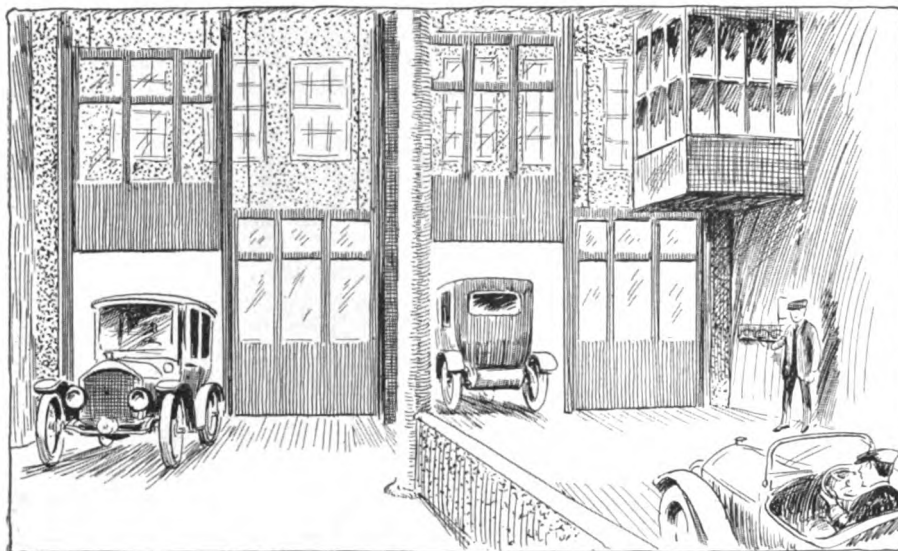
waiting, all congestion have been eliminated.

Elevators Eliminated

Needless to point out, no such results could be obtained through the use of elevators, and hence, the elevators, too, have been eliminated. In their place there is a series of gently sloping inclines, or ramps, as they are more technically known. One ramp extends from the first floor, at an incline of 10 per cent, to the second floor; a second leads to the third floor, and they are broad enough and the slant is gentle enough to

permit of an average speed of 15 miles an hour up or down being maintained quite easily. There is no ramp to the fourth floor.

To handle the 300 cars which are stored in the garage as quickly as they are handled now would have required not less than six elevators. Not only have the ramps made five of these unnecessary—one must be maintained for disabled cars—but they have also eliminated the initial cost of the elevators and their maintenance expense and the possibility of annoyance and congestion in the event of breakdowns. In addition, the ramps



Looking towards the entrance from a position on the ramp running to the second floor. The ramp to the first floor is shown at the right, and the checker's office in the right upper corner

take up less room than would be required for a sufficient number of elevators to give adequate service.

Ramps for Other Garages

Although the A. C. A. garage has but four floors there would seem no reason why such a system of ramps might not be used to advantage for a greater number of floors. For it must be remembered that the number of elevators necessary for adequate service must be in proportion to the number of floors in the building.

The A. C. A. building is new throughout. It was built expressly and purposely for a garage and the system of ramps around which it is built is not its only unusual feature. The building is a brick and concrete structure with a frontage of 125 feet and a depth of 204 feet, and throughout the whole of the construction there is apparent the touch of the hand seeking efficiency—the elimination of waste time and waste energy. But as a time-saver pure and simple, the ramp system is in a class by itself.

Time Saving Big Factor

At the old A. C. A. garage the big problem was to get the cars in and out quickly during the rush hours. But as a matter of fact the word quick never could be used. Frequently drivers were required to wait as long as 20 minutes and sometimes longer before they could get their cars onto the elevator, after which came the exceedingly slow journey upward. Contrast this with the new garage, where the operator of the car drives directly to his car space without wait. In the time it takes him to drive from the street to the third floor an elevator would have raised him only a little above the second floor—provided the elevator were waiting for him.

The arrangement of the ramps is made plain in the accompanying phantom drawing. Short ramps run directly from

the entrance to the first and second floors, since the first floor is 4 feet be-

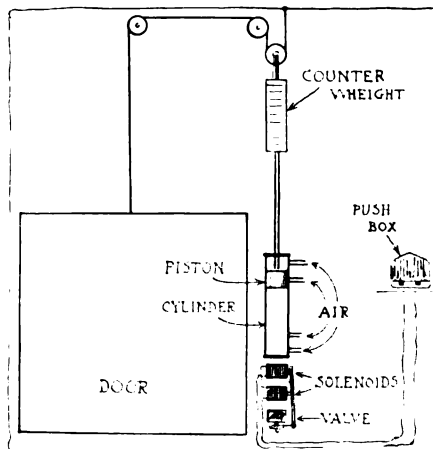


Diagram showing door operation. Compressed air raises the door and it falls by gravity. The air valves are electrically-controlled by push buttons

low street level. There are two doors, one for each ramp. Next the right wall

is the ramp that runs up to the second floor and to the left of this is the ramp sloping down to the first floor. The rise is 1 foot in 10 and the length of the ramp to the second floor is 80 feet and to the first floor 40 feet. The width of all ramps is 18 feet. The ramp connecting the second and third floors is located against the opposite wall and is approximately 120 feet long.

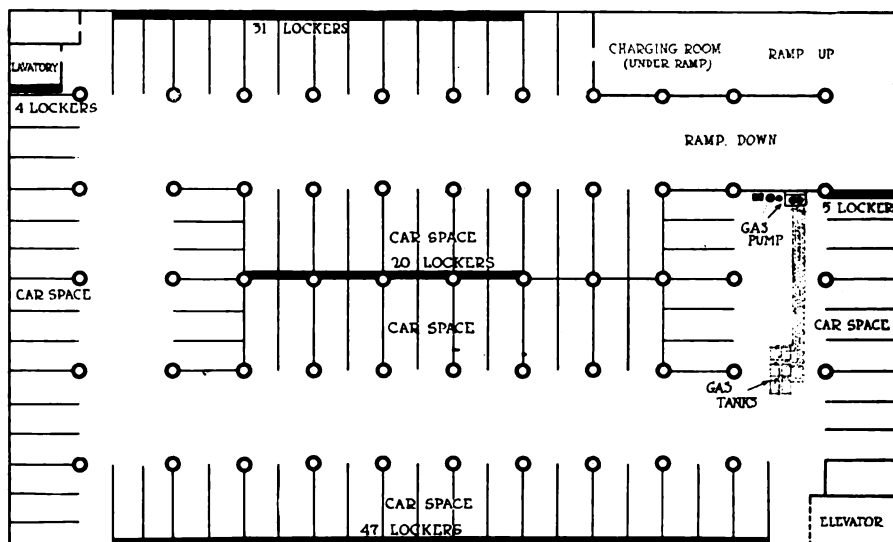
There is no ramp to the fourth floor as no cars are given live storage on this floor, but some space is given to dead storage, and the paint and upholstery shops and the chauffeurs' quarters take up the rest of the area. This floor only extends about half the length of the building.

20 Miles per Hour

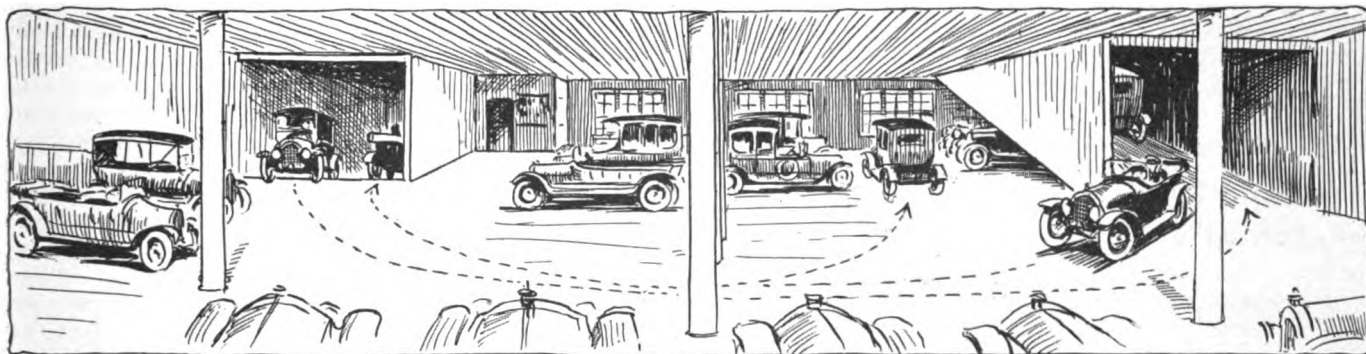
It is possible to drive a car from the farthest corner of the third floor to the street at an average speed of 20 miles per hour due to the width of the ramps, and aisles connecting them, and since the total distance is not over 600 feet the trip is made in less than half a minute, or the time it takes the ordinary elevator to travel two stories. For safety, a speed of 15 miles per hour is more reasonable, but even at this rate the entrance or exit can be made in half a minute, assuming that the car is in the farthest corner of the third floor; it means traveling the length and breadth of the building, down the long ramp to the second floor, and across the second floor to the ramp which runs to the street. Exits from the first or second floors can be made in from 6 to 10 seconds, providing there is no delay in waiting for the front doors to open.

The ramps are wide enough so that two cars can pass comfortably and therefore there can be no congestion, and since the aisles are of like width, they also permit free passage in both directions at once.

The elimination of elevators in this



Plan of first floor showing arrangement of car spaces, location of first and second floor ramps, and gasoline storage system



View from rear of second floor, looking towards front, showing ramp to first floor at left hand and to second at right

garage was the result of inadequate elevator service at the club house garage on Fifty-fourth street. Although there are six elevators these are inadequate to handle the rush-hour traffic of 600 to 700 cars on the nine floors of the building.

Due to the fact that the habits of the members are much the same, there are certain times of the day when there is a very large number of cars to be taken in or out in a very short space of time. For instance, it is quite frequent at 6 P. M. to find the cars lined up two deep for half a city block waiting to gain entrance. This causes a delay of as much as 20 minutes.

Speed Compared to Elevator

This defect has been eliminated in the new garage, as it is possible to move a car out of the building in less time than it would take to carry it down on the elevator, no account being taken of the time waiting for the elevator to come to the proper floor even assuming that it were free to start immediately, and disregarding the time spent in loading and unloading the car.

Not as much space is taken up by the ramps as would be required by a sufficient number of elevators. The former occupy about 6,000 square feet of floor space, since the total length of the three ramps is about 300 feet and the width 20 feet, including walls.

To give fair service, but not as good

as the ramps, five elevators to run to the third floor would be required, in addition to the elevator for disabled cars, now installed. Each, including the shaft wall, would occupy a space about 12 x 20 feet, and the elevator rigging would necessitate the shaft extending through the fourth story. Therefore, the floor space taken up by one elevator would be 12 x 20 x 4, which is 960 square feet, and as there are five shafts, the total

would be approximately doubled on this account.

It is fair to say that the ramp does not take up a greater floor space than its own area, because two-thirds of the space underneath it may be used for storage, the very lowest being used for grease and oils, etc., and the higher part for cars. The opening on the floor above is only about two-thirds the total area of the ramp.

Ramps Might Be Steeper

Furthermore, it is not necessary to make the ramps so wide or so gradual in the ascent, and by going to the extreme, the total space might be cut in half. By experiment it was found that a slope of 15 per cent was practical, but it was decided that inasmuch as ladies would use the garage it would be safer to adopt the 10 per cent incline. A 12- or 13-foot width would be adequate to allow two cars to pass—the present width is 18 feet.

As far as first cost is concerned there is no comparison; the cost of the ramp is practically that of so much floor space, and elevators would require an expenditure of at least \$5,500 apiece. This charge allows \$3,200 for the elevator mechanism complete and \$2,300 for shaft, skylight and fire-doors.

Ten extra elevator men at \$12 per week would be required, a yearly expenditure of \$6,240. Adding to this the interest on the investment and the cost of electric current and maintenance, we have, respectively, \$275, \$350 and \$125, the total being \$750 apiece, as against nothing for the ramps.

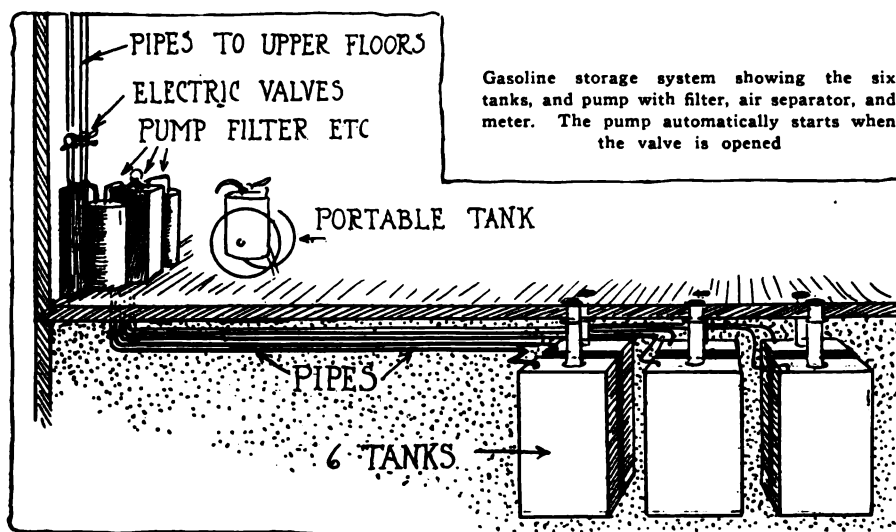
The conclusion is that the ramp construction seems eminently suited for buildings such as this one, with few stories of large area and where one floor is placed slightly below the street level; but nevertheless it does not seem that it would be unreasonable to apply this form of construction to any garage, since the initial cost and elevator maintenance is eliminated and since the area taken up by the ramps may be no greater than that occupied by the elevators.

Another interesting departure has been made in the front door design in that these are opened and closed by compressed air in 16 seconds.



Chauffeur's locker, measuring 5 by 3 by 2 feet. There is a hat shelf in one corner, and hooks for clothing. The locker is large enough to hold tires and oil

area would be 4,800 square feet. To this area, however, must be added an indeterminate amount of floor space for entrances to the elevators at each floor. Possibly the total floor space required



There is one large door for each of the ramps, leading to the first and second floors. The doors open by sliding upwards. They are counterweighted and the movement of a door is accomplished by two pistons operating in long cylinders, the pistons being attached to a cable on either side of the door.

Doors Operated by Compressed Air

The air valves controlling these pistons are operated by solenoids so that all that is required when the door is to be opened or closed is to touch a switch. One set of switches is located directly inside of the doors and there is another set in the checker's office which overhangs the entrance. The maker is the Burdett-Rowntree Mfg. Co., New York city, and it is said that the cost is not prohibitive.

Another feature that is practically new is the use of an automatic, motor-driven pump to deliver gasoline to the different floors, where it is distributed to the cars by portable tanks. All gasoline and oil equipment was made by the Bowser company. This pump is a two-cylinder, geared to an electric motor, and is placed against the wall on the first floor. It obtains its gasoline from six 275-gallon tanks buried under the floor and which are filled through a plug in the street. Valves are provided so that any or all the tanks may be drawn from simultaneously.

When one of the portable tanks requires filling, the padlock holding the discharge valve closed is removed and the valve handle depressed. This automatically starts the motor pumping gasoline. The instant the operator removes his hand, however, the valve shuts, stops the flow of fuel and breaks the motor circuit. This precaution prevents an attendant leaving the fuel running, with the danger of a flood and a fire. Between the pump and the discharge valve is a filter, an air separator and a gasoline meter.

Gasoline Pump Automatic

A by-pass is provided around these three devices so that in case any of them needs repairing the operation can be continued through the by-pass. Similar automatic valves and meters are provided on the second and third floors, but only the main air separator and filter are required. To guard against the disablement of the pump a 5-gallon hand pump has been installed also.

Three portable gasoline tanks are allotted to each floor and there are three tanks, for light and heavy cylinder oil, and kerosene. The capacity of each is 120 gallons and the automatic measuring device delivers $\frac{1}{2}$ pints, pints or quarts.

The three floors are practically identical except for the difference caused by the ramps, so that a description of one

will almost suffice for all. Each floor is supported by five lengthwise rows of ten concrete pillars, which divide the garage into rectangles approximately 15 x 20 feet. Directly inside the outer rows of these rectangles is an aisle extending around the four sides of the building, so that every car has instant access to the aisle without disturbing any other car. Within each rectangle is space for two cars, and as the size is 15 x 20 each machine has a space of $7\frac{1}{2}$ x 20 feet, which is ample.

Around the walls are commodious steel lockers, one for each car. There is a hat shelf, robe rail and four coat hooks, and since the dimensions are 3 x 2 x 5, there is space also for spare tires, oil cans, robes, etc.

Four Wash Racks per Floor

There are four wash racks on each floor, all situated in the aisles near the corners, and as the width of the aisles is 18 feet, there is still ample space for a car to pass.

The lighting arrangement is worthy of note, as there is a light between adjacent cars and one on every other pillar as well as separate aisle lights. The lights between the cars are placed well forward, so that the chauffeur has adequate light for making minor motor adjustments.

A trouble lamp socket, compressed air outlet and vacuum cleaner connection are located on every other pillar in alternate rows.

It is claimed that the fire insurance rates are the lowest in the city for the reason that extreme care has been taken to make the building fireproof and prevent the spreading of fire among the cars. An automatic sprinkler system is installed and fire pails of sand and Pyrene fire extinguishers are placed on every floor. The entrance to each ramp and the elevator may be closed by fire doors. Metal sash and wire glass window panes are used.

The fourth floor, as was pointed out previously, extends only part way back. The front part of one half of it is given over to the chauffeurs, the rear to dead storage, and the other half is a paint and upholstery shop.

Chauffeurs Well Provided For

The chauffeurs' quarters include a small barber shop and lavatory at one side, a spacious pool room in the center, containing two tables, and a lunch room at the other side. Entrance to the paint and upholstery shop is over the roof to the rear; fire regulations prevent this department from having a direct connection with the remainder of the building. It is separated by a substantial fire wall.

The rear of the basement, which is above the street level due to the slope of the ground, is divided off into a

dressing room for ladies, a members' room for the men, and a supply store. The boiler room, compressed air, vacuum outfits and tire pump are also situated on this floor, but in a separate room effectively separated from the rest by a fire wall and only accessible from the outside.

The vacuum cleaner pump is a 10-horsepower machine. Two Ingersoll-Rand Class ER, single-cylinder air compressors, with a capacity of 50 cubic feet of air at atmospheric pressure per minute, are used. One is a spare in case the other should break down. Both are belt-driven from individual electric motors, and the compressor in active service automatically starts when the pressure drops below 100 pounds and stops when 120 pounds is reached. This automatic equipment is supplied by the Cutler-Hammer company.

Club Rooms in Basement

A master clock in the basement controls all the clocks in the building. One of these is the time clock, placed in the checker's lookout directly over the entrance. As each car moves in or out, the checker stamps the time on the individual form made out for that particular car. This form consists of a heavy oak tag card, 4 x 7 inches when folded double. The outside faces of this checking card are printed identically alike while the inside faces are left blank.

The form gives the name of the owner, name of the car, license number and period during which the card was used, which is 2 weeks. Below this there are three double columns with the heading Out and In over each. Each horizontal row represents one day, and when the car goes in and out more than three times the blank side of the card is used. The clock registers the date in red ink and the time in hours and minutes. After the card has served its 2 weeks it is torn in two, one half going to the owner and the other being kept on file in the office.

How Cars Are Checked

To avoid confusion and accident in delivering messages to chauffeurs, two simple forms have been adopted. One is a pink slip 4 x 5 inches, which states, "Mr. —'s Chauffeur. You have been called for at — a. m. and could not be found. Call at the checker's office immediately. This card left on car at — a. m., — p. m. (date)."

When an owner orders his car and the chauffeur is not in the building a yellow slip $3\frac{1}{2}$ x $5\frac{1}{2}$ inches is made out. It contains spaces for the name of the owner, the date, the place wanted, name of car, time wanted and date, remarks, when received by operator and chauffeur, with a place for the signature of each.

Rockford Dealers Find Business at Show

Northern Illinois City Enjoying Prosperity With Crops High and Factories Busy—Rural Trade Plentiful.

With farm products at a high figure and the factories of Rockford, Ill., busy, the show of the Rockford Motor Car Dealers Association the last three days of last week was the best ever staged. Not only was the attendance better but the decorations and other show features surpassed those of other years.

The attendance averaged 2,500 a day at a straight admission of 25 cents, making the receipts about \$2,000; fourteen dealers exhibited 60 cars, and aside from the retail sales on the show floor a number of subagency contracts were signed. Many of the Rockford dealers handle a considerable territory, working that outside the city through subdealers; a large proportion of the business of the Rockford dealers is in the country outside the city.

Must Attend to Exhibit

One of the worthy points in the show space contract is a clause which provides that "each exhibitor must have at all times a competent man in charge of the exhibit with authority to act." This

able to secure attention at any of the exhibits.

Other rules which have been adopted by the association provide that no cards or signs shall be displayed; no accessories shall be displayed unless a part of and attached to a car; cars must not be removed without permission; all exhibitors must be bona fide dealers, this latter eliminating the curbstome men.

Few free tickets were used; if used, they cost the dealer the regular price of 25 cents. Many of the dealers believe that the customer who is really interested is worth 25 cents to the dealer and that others shall pay if they care to see the show.

The exhibitors and their cars were: Joslyn Automobile Co., Jeffery; C. B. Williamson Corp., Studebaker and Dodge; Standard Garage, Cole and Glide; Edward Troller, Maxwell and Chandler; Cadillac Automobile Co., Cadillac, Grant and Haynes; Main Garage, Franklin; H. A. Gabel, Hudson; Hutchins Garage, Buick and Paige; Noben & Rowan, Briscoe; Phillips Flec-

eliminates any dissatisfaction on the part of show visitors through their not being tric Garage, Baker; Imperial Auto Co., Imperial; Lundstrum Bros., Mitchell; Williamson Motor Co., Ford; F. P. Neumeister, Chevrolet and Chalmers; Rockford Overland Co., Overland.

Worcester, Mass., Association Formed

The Worcester County Automobile Business Association was organized last week by dealers in Worcester, Mass., and vicinity. It starts with a membership of 75 and when the next meeting is held in two weeks it is expected that a great many more will join. The officers are:

President, Frederick W. Williams; vice-president, Harry W. Murch; treasurer, H. P. Emery; secretary, Eugene L. Caton; directors, H. J. Murch, F. S. Southergren, of Fitchburg; H. C. Goulding, F. S. Howard and W. T. Ryan, of Webster. There were dealers present from Worcester, Uxbridge, Fitchburg, Leominster, Southbridge, Webster and other nearby places.



The Rockford show was staged in the Coliseum, which offers an extensive floor space unusually free from posts. The decorations were attractive, tires suspended overhead adding a truly motor car atmosphere

WIDE-AWAKE MERCHANDISING

You Must First Find Prospects

Then List Them Systematically, Call Conference of Salesmen and Apportion List—Here's a Plan That Works

You must find your prospect before you can sell him is a prevailing law of salesmanship and it applies directly to the six-cylinder Oldsmobile, says that company's house organ in suggesting to dealers the skeleton of a campaign on the Model 55. It is an excellent summary in enumerated form of the steps to be taken in a dealer's sales work.

In order to wisely direct the efforts of your salesmen, it continues, prepare at the very beginning a list of all the possible buyers of Model 55 cars in your territory. Your list may contain only a very few names or it may run into the hundreds; its size is of no consequence so long as it includes every person in your territory who is financially able to buy a Model 55 Oldsmobile.

Compile a Prospect List

Some of them may own cars of another make—that, too, is unimportant, for most automobile buyers of today are automobile owners.

Your list when complete will contain the names of such people as:

- Bank Presidents.
- Heads of Business Concerns.
- Officers and Directors of Corporations.
- Successful Merchants.
- Retired Business Men.
- Well-to-do Farmers.
- Wealthy Public Officials.
- Prominent Clubmen and Lodgemen.
- Women of Social Prominence.

It is assumed you will have obtained the commercial ratings of those listed either from a personal knowledge of their financial standing or from any of

the various channels through which such information can be secured.

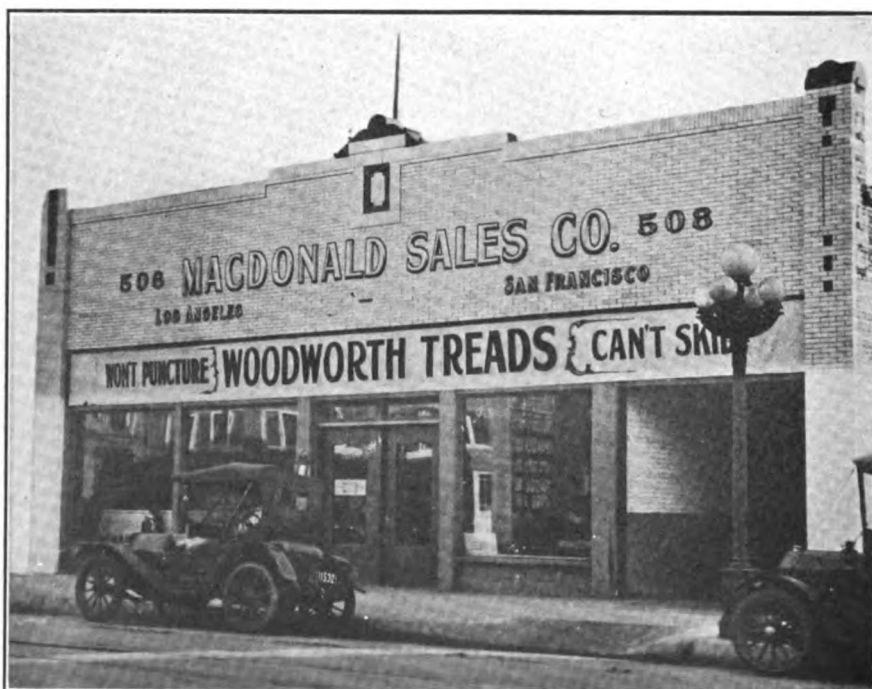
Having this data, you are now ready to break ground in your campaign as follows:

Then Do These Things

- 1—Call a conference of your salesmen.
- 2—Divide the list of possible buyers among your salesmen.
- 3—Instruct each salesman to ascertain whether or not each of the persons on the list assigned to him are in the market for cars. No guess work in this should be tolerated. So impress your salesmen with the importance of this detail of the work that they will, if possible, see each man on their respective lists personally and find out definitely if he contemplates buying a car and if so, when?

- 4—Have your salesmen render you a brief but definite report on each person on their lists. Such reports to read, for example:
Name: John Smith.
Business: Bank Director.
Financial Ability: Excellent.
Car Owned: 1909 Daimler.
In Market for Car: Yes, about April next.
Prefers What Make: Undecided.
Remarks: Too busy to talk autos, but said we might see him about April 1.
- 5—Weed out dead wood; in other words, eliminate all reports which do not hold out even a remote possibility of a sale.
- 6—The result of this preliminary work will be a list of possible buyers of cars. Redistribute this list among your salesmen, making each man directly responsible for the prospects assigned him.
- 7—Now "Follow through;" that is, keep constantly in touch with each salesman individually and your sales force as a collective unit to see that the largest possible amount of effort is brought to bear by the salesman upon his list of prospects.
- 8—Call frequent conferences and ask each salesman to state before all the other salesmen just what he has done in following up his list of prospects since the preceding meeting.

The foregoing plan, in its essential details, is adapted to the use of dealers in small towns who may not employ salesmen, as well as dealers in larger places. We recommend the adoption of this plan by all Oldsmobile dealers.



The McDonald Sales Co., Los Angeles, has just opened a new place of business at 506-8 West Pico street. The company is a Woodworth tread distributor

MAKE EVERY DOLLAR WORK

**See That Every \$ Is Active—
Don't Tie It Up in Unproductive Investment**

One of the best resolutions that the motor car dealer and the accessory dealer can come to for 1915 is to make every dollar work. What does that mean? It means to have every dollar active—as little as possible tied up in unproductive investment. Big failures have come from neglect of this principle. Big successes have often come from its observance.

Two concerns started in business a year ago. To be sure, the businesses were not exactly the same. Businesses never are; they always have their points of difference even in the same line. But these two businesses were alike in that they both had the same amount of capital paid into them. Each had \$10,000.

One Was 40 and Experienced

One manager was forty; he had experience. He rented a place for \$50 a month, and his entire office furniture, including stenographer's desk, book-keeper's desk and his own desk, with a rug for his office, and every other necessary piece of office equipment, cost \$126.

The other manager rented a place for \$175 a month, bought a beautiful mahogany desk and chair, a handsome desk lamp and furniture that ran close up to \$800. In other words, he took about one-tenth of his money and invested it in unproductive materials. This precedent followed throughout the business. At the end of the year the report showed that while a good business had been secured additional capital was necessary to carry it on.

Not the Desk That Counts

The first man referred to—he of the experience and the forty years—said he could write just as many orders on oak as on mahogany. And he proved it. The business paid dividends the first year. And the thing that made it possible to pay dividends was the testing of every purchase, every investment by the simple question: Is this a productive or unproductive investment? Even an amount not exceeding five dollars was subjected to this searching inquiry. The result was that there was no chance for anything fancy or unnecessary around the place.

You have your furniture. You have your equipment. Your history has to a considerable extent been written. But a new year is before you. Perhaps you can write more profits into it by thinking and acting on the principle which has been indicated.

PERSONALITY COUNTS AND NOT APPEARANCE

**Your Methods, Your Ideas and Your
Ideals Are Your Assets**

What counts? It isn't the fixtures. It isn't the location. It's the PERSONALITY of the men—their methods, their ideas and their ideals.

Just a few days ago a Detroit dealer received the final payment on a big six-cylinder touring car. The customer had never seen the car. He ordered on faith because he believed in the dealer and he had "always taken good care of him."

He said to the dealer, "You pick me out a car. You know what I want better than I do. I'm too busy to come up to the salesroom. Here's my check for \$500. Pick me out the car you think I ought to have."

The dealer ordered the car for him. When it arrived the customer was notified. He waited six days and then mailed the check for the balance of the money to the dealer, saying he was too busy to come up to see the car but he knew it would be all right. Please keep it for him till the weather moderated! Then perhaps he would come up and take a ride in it. In the meantime he was satisfied.

Back of such faith is character and personality.

REACH OUT AND GET BUSY

**If You Want Prosperity, Do
Your Share to Bring It—
Start Something**

"Reach out and grasp opportunity," was the New Year's message of Secretary Redfield of the Department of Commerce to the business men of the country. Couched in characteristic language, the message urged the dispelling of all false gloom and the courageous progress despite glooms and fears. In part he said:

Don't Sulk—Get Busy

"If you want prosperity do your own share to bring it and do it now. Get that addition to your shop going; it will cost you less today than six months hence. Is trade a bit dull in the works? Get those improvements begun. Prices are low and likely to rise. You've been thinking of that contract work; better start it yourself before things get the start of you.

Our Country Never Stops

"This country slows down a bit now and then, but it never stops growing and it always moves up and not down. We don't know what it means in most of the United States to have real genuine distress. Think of Belgium and Poland. O, man with a grouch, slink into your hole and pull it in after you. There think of your sins and your blessings and come out with your courage in working order."

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. One is illustrated herewith and this will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



It is an old business axiom that goods well displayed are half sold. Put what you have to sell where those who come into your store can see it. Compel them to see it.

This little glass counter case is supplied by the Silvox Co., New York, to dealers who handle its Bethlehem spark plugs. It will stand on a show case and not many prospective customers will pass it by without a second look. Its mission is to attractively display the merchandise in it and it serves its mission.

Completely Refinishes Cars in Three Days

Compressed Air Gun Used to Shoot on Paint and Varnish

Drying Scientifically Effected With Humidified Heated Air

Grease, Dirt and Old Varnish Quickly Blown Off by Steam

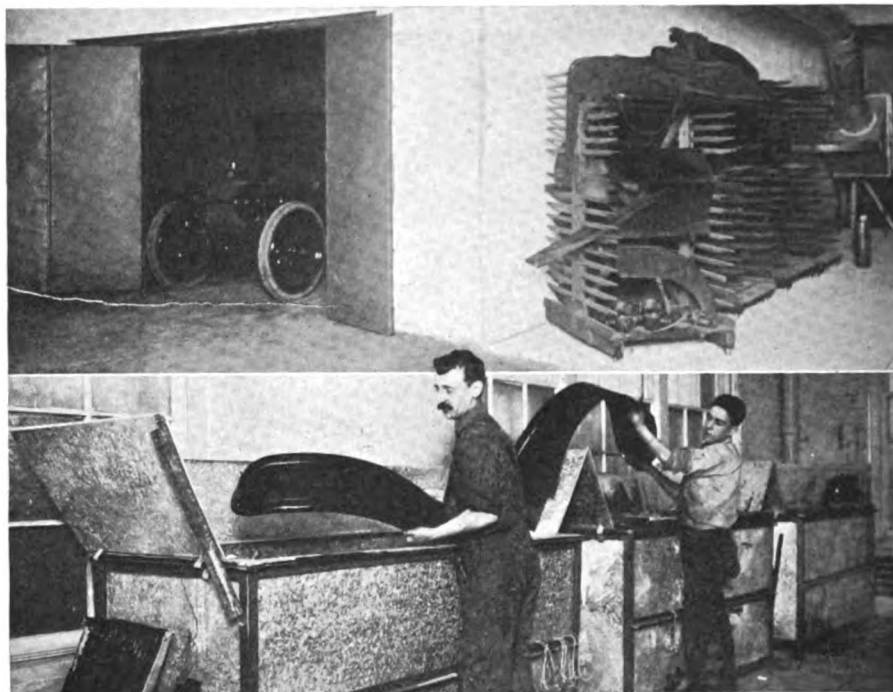
A direct effort to give more efficient service to car owners who desire their vehicles refinished has been made by the Fickling Enameling Corp., Long Island City, N. Y. The process used has been named the Radio by this concern and by it complete automobiles can be japanned in the unusually short time of three days. This concern makes a specialty of quick-drying methods, and by the use of up-to-date appliances has cut down the length of time spent in each process to the minimum.

When a car is driven in, it is put with a group of others to make up a unit job in passing through the plant. The units consist of four or six cars. The first operation is to clean the car, and this is done by the use of a steam jet, which cuts away the grease and eliminates the rubbing which would be necessary by other methods. After the grease has been removed, the tires are taken off, as are the fenders and all the small parts which will require separate enameling.

Car Divided Into Three Units

The other accessories of the car are placed on horses containing a large number of racks upon which the parts can be suspended and kept together. Thus, each job is divided at once into three units after the preliminary cleaning has been completed. The first unit is the body of the car and that part which requires repainting. The second unit includes the small parts to be enameled, such as the fenders, engine hoods, etc. The third unit includes the accessories which do not require either enameling or painting.

The car proper and the small parts which require enameling have reached the parting of the way as far as the painting processes are concerned, when they are disassembled. As a general rule the paint does not have to be removed down to the bare surface of the body, but merely has to be rubbed down and filled after the cleaning has been completed. The filling brings the surface to a level and smooth condition and it is ready for its first coat of paint.



Upper left: Car rolled bodily into a huge oven where the air is hot and humid. Right: Racks for holding sheet metal parts. Lower: Enameling is done by a dipping process, an English expert handling the work

This is a coat of color paint and forms the primary foundation for the finished job.

When this coat has become dry a coat of color varnish is applied, which is afterwards rubbed down, and finally the finishing coat of varnish is applied. This corresponds exactly to what would be done in the ordinary paint shop as far as the general details are concerned. It is in the method of application and drying that the Radio process is claimed to save time and give a greater efficiency than is possible with the ordinary brush method. The paint instead of being applied by brush is put on with a gun which in appearance resembles an automatic pistol and is operated by a trigger, held by a pistol-shaped handle, and with the paint spray issuing from what would correspond to the gun barrel. The gun is a mixing chamber for air and paint, the result being that the paint is atomized and can be directed against the work in the same manner as with the ordinary air brush. This cuts the time of applying the paint and results not only in a more economical use of the paint itself, but is of great aid in applying the paint to inaccessible spots about the car.

Drying Done in Enormous Ovens

After the color varnish coat has been applied and rubbed down to a smooth surface, the entire car is placed in an enormous oven, measuring 42 feet in length and 19 feet 6 inches in width, and allowed to dry. The temperature in this

oven is 120 degrees with 100 degrees of humidity, and the air is renewed every three minutes by means of an exhaust fan. In this oven it is possible to take care of six average cars every three hours. During this time the varnish coat is completely dried and rendered hard. After being rubbed down the finishing coat of varnish is applied in another oven or finishing room, where the temperature is from 90 to 100 degrees, and the job is complete.

Humidity Assists Proper Drying

It is in the oven in which the color varnish coat is dried and hardened that the most radical departure from ordinary methods is made. The use of the high humidity keeps the exterior of the surface damp while drying the interior; thus instead of putting a hard shell over the soft layer of paint, it is dried throughout. When the exterior is dried, while the interior remains soft, the paint is apt to sweat through and discolor the finish. This is noticeable on engine hoods where the heat of the motor produces this sweating action rapidly and consequently results in dulled finish.

Thermostatic control regulates the temperature in this oven and water control on a diaphragm regulates the humidity in the large oven. All the air which enters the oven is water-washed by running it through a water tank before it enters the oven. It is pumped into the oven by a fan blower and superheated by contact with a radiator. The

varnish, which is dried in three hours, is what is ordinarily known as a three-day varnish, and with the method of humidifying the air the general process where no humidity is employed is virtually reversed, because with the dry air method the exterior is the first dry coat whereas with the moist air the inside coat is first dried.

Sheet Metal Parts Separately Treated

Beside the bare process many precautions have to be taken and many accessories used in order not to have the entire work spoiled by overlooking a small necessary detail. The color varnish coat is applied in a varnish room where everything is kept tightly sealed against all possibility of the entrance of dust and the entrance to the oven is had without leaving the room, the oven itself being really a room within this outer varnish room. The entire floor upon which the various departments of the work are kept is cleaned every night by means of vacuum cleaners and all air water-filtered.

While the body and the chassis of the car have been going through these processes the fenders and hood, together with the lamps or other parts to be

enameled, have also been taken care of. After removal, the fenders and other parts are dipped in a hot ash bath, which removes all the dirt and former coats of enamel, leaving the metal bare and bright. Before going into the next process all the dents are taken out of the fenders and they are restored to their correct curvature and repaired to overcome the effects of rough usage. These smooth parts are dipped and taken into a separate room in which there are two ovens, one a flash oven in which a high temperature could be reached in a short time by a direct gas flame and the other a steady heat oven capable of handling the ordinary small parts as they come through from the dipping bath.

Enameler Imported to Do Dipping

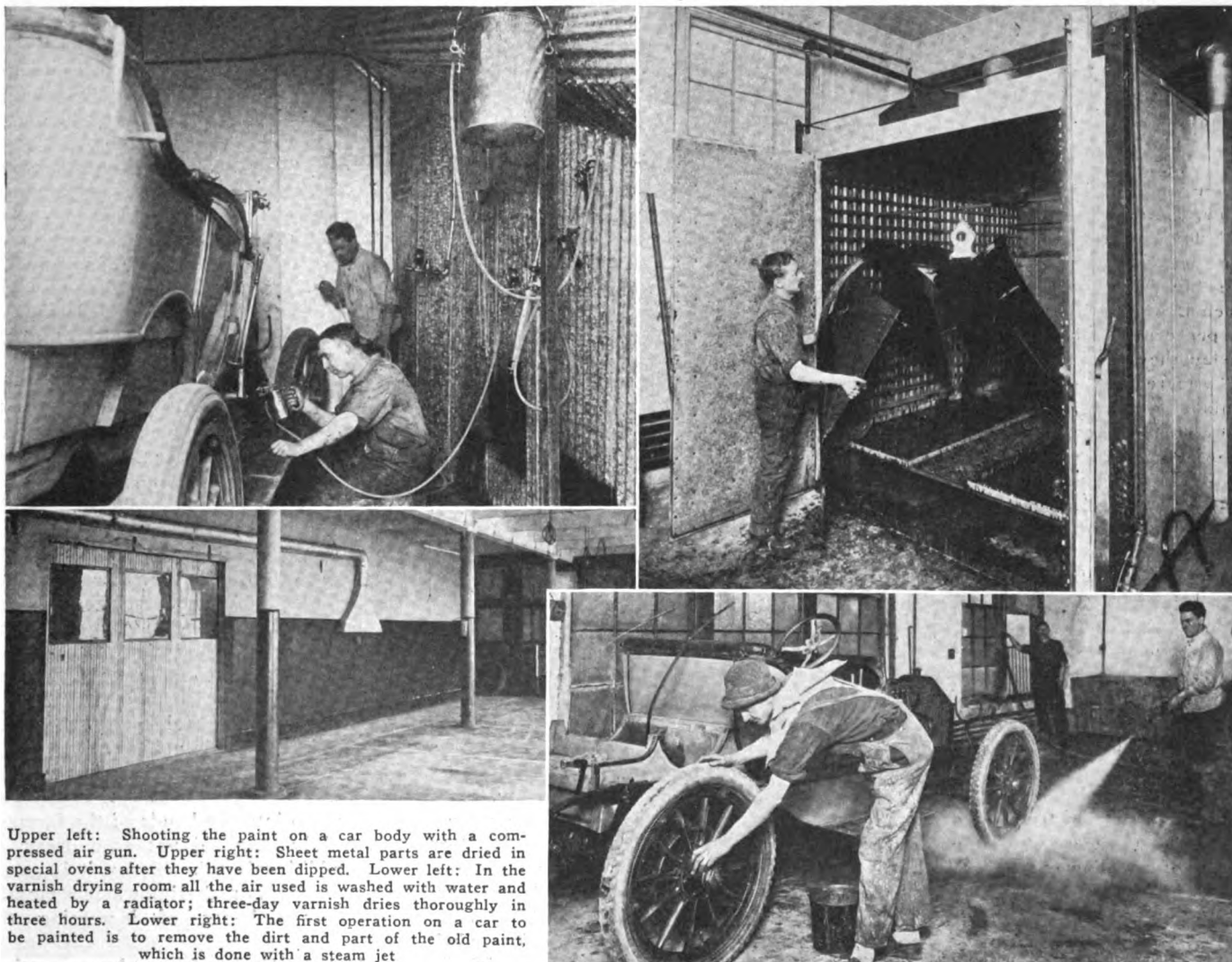
The dipping process is in charge of a workman who has been imported from Manchester, England, the home of the enameling art. This man dips the large, smooth parts bodily into the enamel and then pours the enamel over the work to remove any air bubbles which may have gathered on the surface, and which, should they dry, would chip off, leaving spots upon which there was no enamel. After being allowed to drip for a few

seconds, the part is taken to the adjoining steady heat oven and placed therein to dry. Lamps and articles which cannot be dipped in enamel have the color applied by means of the air brush.

Quick Finish for Wood Wheels

By the time the fenders and small parts have been finished, the car to which they belong has also been completed, and the two meet at the assembly department, where everything is replaced as it should be and the car is ready for delivery to the owner. The natural question on the part of the owner is, "What is this quick service going to cost me?" The answer given by the Fickling company is that the price is from one-half to one-third that charged by high-grade concerns for a similar finish by the brush method. The average price quoted for a medium-size six-cylinder five-passenger touring car, in which the previous paint is in such condition that it need not altogether be removed, but can be rubbed down and refilled, is \$60.

Wheels finished in the natural wood color and desired refinished in the same way, are dipped in acid and after 15 minutes a neutralizer is applied, leaving the wood clean. They are then varnished.



Upper left: Shooting the paint on a car body with a compressed air gun. Upper right: Sheet metal parts are dried in special ovens after they have been dipped. Lower left: In the varnish drying room all the air used is washed with water and heated by a radiator; three-day varnish dries thoroughly in three hours. Lower right: The first operation on a car to be painted is to remove the dirt and part of the old paint, which is done with a steam jet

Kansas City Show Attracts 3 Classes

Dealers, Distributers and Owners Swell Attendance—Farmers Principal Factor in Territory of 204,700 Square Miles That Takes \$39,000,000 Worth of Cars and Accessories a Year

FARMERS, motor cars, wheat and stock are the big four of the Kansas City territory, and the annual motor car show which held the boards all last week in Convention Hall, has served admirably to emphasize to the citizens in this part of the grain belt how dominating an influence is the motor car. The all-pervading influence of the car has assumed a new form in this city during the last 2 weeks since the invasion of the jitney car and jitney bus, there being already over 222 of such vehicles registered. At last the great middle class, nearly 45,000 of them at least, is daily making use of this new-found means of locomotion, and thousands are daily imbibing the magnetism of the car, who, perhaps, in their most optimistic moments had not hoped to ride to work in a real gasoline car for years to come. With this new movement another great missionary force for the car is set in action.

Three-in-One Program

The Kansas City show is a dealers' show, a distributors' show and an owners' show. It is a three-in-one program. Convention Hall, when opened years ago was the target of ridicule for the city. Then it was so big as to be useless—so 99 per cent of the population thought. Today they think otherwise and its 50,000 square feet of floor space is but a tantalizing area for half a hundred or more distributers and dealers who showed their cars all week. This huge hall, nearly a smaller edition of Madison Square Garden, New York, in general design, is not half large enough for a motor car show.

Estel Scott, president of the Kansas City Dealers' Association, and also general manager of the G. M. C. truck interests, reports forty-nine members in his association and every one is in the show, making a grand total of vehicle shown of 192, just one less than was shown at the Minneapolis show. Of this number, 140 are gasoline passenger cars, seventeen electrics and one steam car. There are also thirty-two trucks and two tractors. There were fifty-one different makes of gasoline cars, six of electrics, seven of gasoline trucks and two of tractors.

As a dealers' show, Kansas City scarcely comes up to the status of Min-

neapolis, numerically considered. On Monday, opening day, 340 out-of-town dealers registered; on Tuesday the figures were 700, making a total of 1,040 for the first 2 days, and a conservative estimate made by Manager E. E. Peake, placed the total for the week at 2,500.

Bring Prospects to Town

Practically all of these dealers brought their prospects into town to see the show and see the cars. One dealer from Salina, Kan., was here with four prospects, having paid the railway fare of all. Less than 3 hours after he had taken them to the show he was filling out their specifications for new cars. In another booth a dealer from St. Joseph, Mo., was getting a signature to a car contract from a prospect he had brought over. So it was every day at the show and in a great many of the exhibit spaces. It is a conservative estimate that a majority of the dealers from the territory brought in prospects and closed sales.

Territory in Kansas City is not so much a matter of geography as at Minneapolis, as this metropolis is more hedged in with such centers as Minneapolis, Omaha, Sioux City and Dallas on its confines. Generally the large distributor outlines his territory as follows: All of Kansas, the western half of Missouri, Oklahoma, and the northern part of Arkansas. This is not a hide-bound territory as some dealers here have all of Missouri, excepting St. Louis; some have only the west half of Missouri and the east half of Kansas; some have only the state of Kansas; and others are merely dealers and have Kansas City with its adjoining country.

Area is Equal to Germany

Measured in square miles this zone is one of no mean proportions, and while not embracing so many broad acres as served by the Twin Cities, it serves a zone studded with progressive farmers and stock raisers. The total area served is 204,700 square miles, an area practically equal to that of Germany, practically the same as that of France, yet one-half smaller than the distributing territory served by Minneapolis and St. Paul.

Into this zone last year Kansas City distributed \$39,000,000 worth of motor cars and motor car accessories—wholesale price figures. The Commercial Club

of this city is responsible for the figures, and further subdivides these into motor cars to the value of \$33,000,000 and accessories valued at \$3,000,000. This means a jobbing business, as the distributor or dealers buys the goods and sells them either retail or through dealers to the territory.

Live Stock and Crops Important

But if not boastful of its status as a motor car manufacturing center, Kansas City is not slow in producing its statistics on live stock, crops, etc. This city is the second live stock market in the world, coming second only to Chicago, with Omaha ranking third. Last year the total receipts at the local stock yards totalled \$192,500,000. Cattle makes up \$131,000,000 of this total, hogs \$49,000,000 and sheep \$12,000,000. As this stock all comes from the farms in this territory, and as farmers buy from 80 to 95 per cent of the motor cars sold annually through this center, the value of stock yards to the car maker becomes at once apparent. Invest this alone in motor cars and you would absorb more than 200,000 annually of our more popular cars, listing between \$750 and \$1,000.

But Kansas City has wheat, corn and oats. This week the grain dealers' association met here and bewailed the fact that of the 180,000,000 bushels of wheat grown in this state last year there yet remained 35,000,000 in the granaries of the farmers, who are boasting that they will hold it for \$1.75 or \$2.00 per bushel. Last July the farmer hoped to sell his wheat for 60 cents a bushel; some did. One farmer from the center of the state told in a booth during the show how he sold his 15,000 bushels at 60 cents. This meant \$9,000. At \$1.50, the present price, it would have meant \$13,500 additional. Had this farmer been fortunate enough to have held on, to have today had this \$13,500 additional in bank, is there any reason why he would not have been vitally interested in a \$3,000 car?

The state of Kansas is going to have approximately \$100,000,000 of unexpected money go into the hands of the farmers. Last July they did not even dream of this additional cash. Today it is partly in their hands and within a few months they have hopes of increasing the amount.

And the Kansas farmer buys cars just

as the Minnesota farmer, the Nebraska farmer and the Iowa farmer. The Ford dealer in Salina, Kan., a city of 10,000 in the center of the state, distributed 2,000 cars last year and is going higher for this year. So it is with Overland, Buick and Studebaker, the big four in motor parlance in the state. But Salina represents a part of the state that has not been on the crest of prosperity's wave. Local inhabitants say they have had 4 poor years, but with the bumper wheat crop of 1914 the farmers have paid old bills and have a little bank account remaining. But better still they are optimistic. The winter is most favorable, there being plenty of snow on the ground, which gives assurance that the subsoil will be well soaked and that in spite of dry weather a good crop for 1915 will be practically assured.

Farmers Buy Sixes for Power

But farmers do not all buy Fords, Buicks, Studebakers, Hupmobiles or Saxons. They buy sixes. Primarily they want power, and with many the six is a synonym of power. The state has hills, clay roads and gumbo roads. These must be climbed, preferably on high, a la Ford, and the six is attractive with not a few. One farmer this week signed his order for a \$5,000 six, seven-passengers and painted white. He lives 9 miles in the country and is the acknowledged social leader in his section. One company selling cars at over \$2,500 puts 150 cars a year into the state, and of these 95 per cent go to the farmers.

For 1915 the farmer of Kansas is buying a slightly higher priced car. He is going up in the price scale. This does not mean fewer of the cheap cars but a widening of the medium-car market. Not a few with cheap cars last year are keeping these and buying cars listing at \$1,000 or thereabouts. A considerable number are buying \$1,500 machines.

Kansas Farms High in Value

Kansas has 177,840 farmers, the average farm is 244 acres, and the average value per acre \$35.45. This means an average farm value of \$8,649.80. This value per farm compares favorably with Illinois, where the average value of a farm is \$12,255. Kansas outstrips the New York farmer, whose average land value is \$3,264 per farm. Here are some illuminating figures on the average sizes of farms in some of the different states and their average value per acre.

In this list Kansas stands second to Nebraska in the size of farms, and then come Minnesota, Iowa and Oklahoma. When the value of land per acre is considered, Kansas is led by Missouri, and Oklahoma takes third place.

But Missouri and Oklahoma must not be overlooked as farm states and also as car consuming centers. A dealer from Joplin, Mo., spoke with pride of over

COMPARATIVE VALUES OF FARMS IN SEVERAL STATES

State	Average farm (acres)	Average value per acre	Average farm value
Kansas	244	\$35.45	\$8,649
Missouri	124.8	41.80	5,216
Oklahoma	151.7	22.49	3,411
Illinois	129.1	95.02	12,267
New York	102.2	32.13	3,283
Ohio	88.6	53.34	4,725
Connecticut	81.5	33.03	2,691
Nebraska	297.8	41.80	12,448
Iowa	156.3	82.58	12,907
Minnesota	177.3	36.82	6,528

twenty farmers around that center who own farms of over 500 acres each, and each farmer financially able to own not one cheap car, but one or more cheap cars, one a large car, a motor truck and a tractor for general farm work.

Missouri has 276,578 farmers and here is how these divide up as to acreage:

Farms between 50 and 100 acres..	74,178
Farms between 100 and 175 acres..	80,120
Farms between 175 and 259 acres..	32,109
Farms between 260 and 500 acres..	19,812
Over 500 acres.....	3,971

Here we have a total of over 200,000 farmers, the majority of whom are in the field for motor cars of one type or another and all of whom hope some day to own motor cars, perhaps farm tractors and motor trucks.

Distributor Has Fine Field

But pass on to farm totals in the Kansas City distributing territory, and here we have them:

Farmers in Kansas.....	177,840
Farmers in Missouri.....	276,578
Farmers in Oklahoma.....	190,000
Farmers in part of Arkansas.....	70,000

Total714,418

In a word, the Kansas City distributor has as his motor car selling field almost three-quarters of a million farmers, and these farmers are located in the granary of the world. In these days of war the value of the farmer rises daily. It is conservatively estimated that no country engaged actively in war can produce more than 40 per cent of her normal output. With eleven European lands engaged in the great war, it is now on Kansas, Oklahoma, Missouri, Arkansas and the other great Mississippi valley states served by the Twin Cities, Omaha and Dallas that the eyes of the world are fixed. As one dealer tersely put it, of this great surplus going to our farms, the implement dealer and the motor car dealer are going to come in for the big share of the extra cash. The old-standing small bills will be wiped out, many are already, and then the motor car has its innings.

But gasoline cars have not the entire field, the electric is coming to the fore. It is becoming customary to discard the old bell signal and install the electric

horn. Kansas has 290 electrics throughout the state; add to this 120 in Oklahoma and 145 in rural Missouri and you have the electric totals outside of the three leading cities—St. Louis, Kansas City and St. Joseph, Mo. Here are figures from registrations:

Kansas City	1,200
St. Louis	800
St. Joseph	40
State of Kansas.....	290
State of Missouri.....	145
State of Oklahoma.....	120

Total2,595

In Kansas City the electric passenger car seems a paradox. Before getting off at the big new union station you imagine that the electric is not here, but you are pleasantly disappointed. Kansas City must be counted as a good electric town. Omaha, with hills not the equal of those here, does not pretend to use electrics. But here the electric has mastered the hills. Women drive them summer and winter, up and down hill. The closed car is everywhere; in fact, the roadster or cabriolet type is not in demand.

But it is not all a clear course. Two years ago when the electric starter was made standard equipment on the gasoline car it was expected that the electric would suffer. It did a little but not heavily. During the last year the cheaper coupe type of gasoline car has been the biggest rival of the electric. This promises to continue and each week sees some user of an electric buy a gasoline coupe and, vice versa, some gasoline car user discontinue it and adopt the electric. In spite of electric starters and closed types, the electric vehicle is a popular city and suburban vehicle.

How the electric is invading rural Kansas, Missouri and Oklahoma is well illustrated by a sale made last year to a farmer living 6 miles out of a city of 20,000. This farmer wanted a simple vehicle and selected the electric. After buying it he purchased a stationary gasoline engine and a small electric generator for charging. No sooner was this done than he conceived the idea of buying a battery for lighting his home, so that today the generator unit is used one day for charging the vehicle battery and the next day for the lighting battery.

New Eisemann Adjustable Magneto Coupling

Fits Standard Magnetos and Has Unusually Large Surfaces

Completely Enclosed But Easily Adjusted—Three Parts

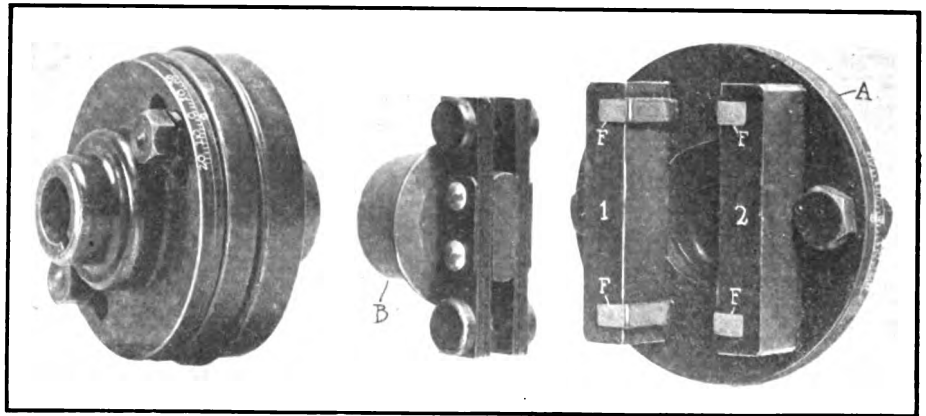
The Eisemann Magneto Co., Bush Terminal, Brooklyn, N. Y., has developed a new type of flexible, adjustable and fully enclosed magneto coupling, which has a number of unusual features. It is designed for use with any standard magneto, is easily applied, and when in place permits of the removal of the magneto in a simple manner.

The principal purpose of the coupling is to allow of a certain amount of deviation in the driving and driven shafts and to protect the magneto bearings; at the same time, it cushions the driving power.

The device is distinctive for three reasons: (1) It is fully enclosed and therefore dust and dirt proof, though the housing is easily removable without the use of tools; (2) it has exceptionally large, flat wearing surfaces; (3) the magneto timing may be adjusted over a range of some 40 degrees—plus 20 or minus 20—without dismounting either the coupling or the magneto.

There are five essential parts to the device, though the cover may be viewed as but one part. These are the driving member, A, which is attached to the magneto driving shaft in the usual manner; the driven member, B, which is attached to the magneto armature, and the casing, C, which encloses the whole.

There are no moving parts in the driving member, which consists of two metal plates, 1 and 2, which are attached to a face plate. This face plate bolts to a second plate, which is keyed to the driving shaft. The bolts which hold the two plates together are fitted into slots,



Left, the coupling assembled, showing adjusting bolts and timing calibration; center, the driven member; right, the driving member, showing large fiber insert wearing surfaces

thus providing for a variation in the timing range. By simply loosening the bolts it is possible to shift one driving member with relation to the other and thus to alter the magneto timing. On the outside of these members there is etched a series of marks which are plainly visible even with the casing in place.

In order to provide for ample wearing surface large fiber plugs, F, are inserted in the plates 1 and 2 as shown. The driven member, B, consists of a number of laminations of this spring steel riveted to the central part. This is inserted so that the round metal buttons bear against the fiber plugs.

The springs cushion the drive, and whatever eccentricity or misalignment of the shafts may exist is allowed for by the sliding of the metal buttons over the fiber plugs. Incidentally, as these plugs are large in area and the contact surfaces are flat, the wearing surface is ample.

One of the excellent features of the coupling is that it is possible to remove a magneto quite easily. The driving and driven members are simply placed vertically and after the bolts holding the

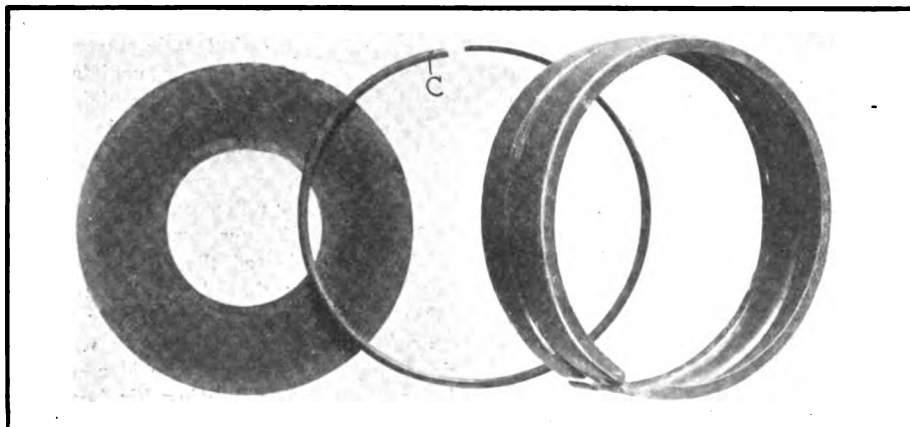
magneto have been removed the instrument may be lifted straight up, the driving member sliding off the driven member. It is not necessary to slide the magneto backward in removing it, so that the use of dowel pins in the holding bracket does not interfere.

The covering, which excludes dirt, is a light metallic part, held in place by a spring ring which fits into a groove. This casing may be removed, to inspect the coupling or for the removal of the magneto, by simply taking off the spring ring and the casing, both of which can be slipped over the drive shaft.

Ohio Dealers Organize.

The Ohio State Auto Trades Association was formed at a meeting held in Columbus last week. In all, 45 counties in the state were represented. The object is for the mutual betterment of those engaged in manufacturing and selling motor cars and accessories. The present organizations in Columbus, Cincinnati, Cleveland, Toledo and Dayton will be affiliated. It is planned to organize county associations in other counties and have them affiliate with the state association. L. M. Browne, of Columbus, was elected president, and J. P. Gordon, of Columbus, secretary and treasurer. Vice-presidents were elected as follows: W. S. Barrett, Chillicothe; W. Faunce, Youngstown; C. L. Hansbarger, Lancaster; C. M. Ross, Johnstown, J. C. McBeth, Upper Sandusky; W. L. Huffman, Marysville; H. S. Shaner, Circleville; H. M. Rathburn, Springfield, and J. P. Hoffman, Plain City. A general meeting of the new organization will be held at Columbus within a few weeks.

A branch has been opened in Buffalo at 20 Goodrich street by the H. C. Faust Co., Philadelphia, Pa., manufacturer of the Panther spark plugs. Herbert C. Faust is manager.



The casing which excludes dust and dirt is a light metallic ring which is held in place by a spring ring. The casing is easily removable without disturbing the magneto

Concentrate on Prospect Calls

Each One Is an Opportunity—Failure to Intensify Nets
an Aggregate of Below-Par Results

By Ray W. Sherman

"I TELL you we're not going to build an eight!"

"And I tell you again that everybody says we are!"

"Aw, forget it! Let's talk about something else." With this final invitation, Jim, the Sales Manager, readjusted himself in the leather cosy corner of the Mathcroft and declined to be further third-degreed on the subject of eights by Reilly and Tom Meck.

Reilly—like every other dealer whose manufacturer had not yet joined the eight parade—had dodged the question ever since the procession started, and Meck, who was the Sennett's dealer emissary in the Middle West, had been besieged by his selling army for accurate information on the question.

The Old Man's Edict

"If that's straight, Jim, all right, but if you hand us a wrong steer, the Lord help you," threatened Meck.

"Well," countered the Sales Manager, "that's the Old Man's edict. He says no eight for a straight year anyway. I know for certain that we are not experimenting with the proposition. And outside of that what do you know about our new southern territorial man, Compton?"

"Oh, that fellow from the Congress outfit?" said Meck.

"Yes, that's the man."

"Why, what's the matter with him? Isn't he working out to suit? How did you get him? Did he quit or resign his other job?"

"Darned if I know," cogitated the Sales Manager. "He got in touch with us when he heard we would need a man

in the South and showed up a pretty good term of service with the Congress people, and we took him on. He started in well, too."

"Didn't he keep it up?" asked Reilly as he discarded a snipe and clipped the end from a fresh Havana-filled.

"It's funny about him," said the Sales Manager with meditative wrinkled brow. "He seems to work like the devil and all that and did accomplish a little at the start, but his curve of results is going down instead of up. He covers a lot of territory and sees a pile of people, but the reports he turns in are far from encouraging."

"Huh!" grunted both the listeners.

"You know," continued Jim, "we want to get a foothold in the South. So far as our distribution is concerned in other parts of the country we are pretty well fixed and we have been able to market all the cars we have built, but, of course, we aim to be bigger some day and will have to have a greater distribution, so we want to get a start and introduce our cars in sections where they are now weakest. The cars have made good in the South, but we have few dealers there, so we want to get planted there. That's why we wanted a territorial man in that section."

Saw Heaps of Dealers

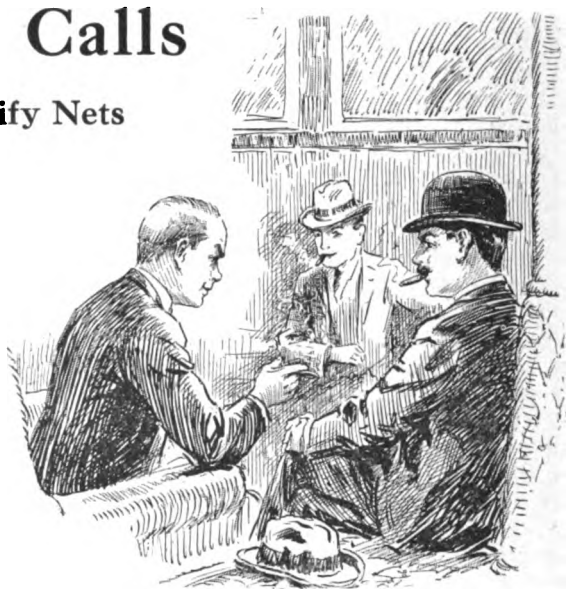
"What's Compton done?" asked Reilly.

"Why——," the Sales Manager grew thoughtful, "why, he has, as I said, seen a lot of prospective dealers, but he hasn't signed up many of them. He——"

"Maybe he covers the ground too fast," suggested Meck.

"You know, I've thought of that," replied the Sales Manager. "I've wondered if that wasn't his fault. You see, I am not on the ground and can't judge as well from a distance, but it really has occurred to me that that may be his failing. He certainly covers ground enough; we can't kick on that score."

"Charley McGrain, my oldest salesman, did tricks of that kind when he first came with me," smiled Reilly. "I think he established a record for covering the ground; he was like a man who hoes corn so fast he doesn't get all the weeds out or stir up all the dirt around the young shoots. You remember, Jim——," Reilly laughed, "——how the Old Man used to say, 'Not so fast!'



"He was like a man who hoes corn so fast he doesn't get all the weeds out or stir up all the dirt around the young shoots"

Jimmy! Not so fast! A little less speed and a little more hoein'."

"I certainly do! I guess Meck used to do those things, too, when there was a nice cool swimming hole down back of the lot."

Skipped About the Town

"Oh my, yes!" was the truthful answer.

"Well, it was the same with Charley," continued Reilly. "When he started in I gave him a small prospect list and showed him how to build up one of his own. He was a willing worker and did well at getting a good list. He also was so willing that he thought he ought to be able to sell them all in about a week. He certainly skipped over the town. He perhaps thought he would make a good showing by turning in a long list of calls even if he didn't produce any sales."

Meck and the Sales Manager smiled at remembrances of past experiences of their own.

"One day I asked him how he was getting on and talked things over with him, and we analyzed his work and the results. He realized that something was the trouble and was on the point of getting discouraged. He thought he never would make a salesman. By looking over his reports we discovered that the number of calls he had been making was high—entirely too high. No man could hope to get much cream by such a superficial skimming."

"I advised him to slow up a little and not waste so much physical energy in jumping from spot to spot. I advised him to go a trifle slower, plan a little better, work a little harder or a little longer on prospects when it was advisable and make every call count for something. This ducking in the door, saying, 'Want a car today?' and ducking



"If the prospect is inclined to resent being followed up these useless calls hurt the sale"

out again kills business instead of helping it.

"With the average prospect I figure that a salesman can call about so many times—or so often—and that each one of these calls is of priceless value. The salesman should make them count or not make them at all. If he says to himself, 'I'm passing Smith's today; I'll run in and give him a look, it won't do any harm,' he may be fooling himself.

"If the prospect is inclined to resent being followed up these useless calls hurt the sale. The salesman has checked one off the list of the permitted number of calls and the call hasn't been of any value. Each call should logically follow the one preceding in sales work; they should be so linked together that the whole series forms a part of a little campaign. And these stick-your-head-in-the-door-and-run-out-again visits don't get a man much. They aren't a part of any sequence.

"Charley started out anew and things came better. He made fewer calls—but they counted for more. It wasn't long before he began to land a few sales and he finally developed into a good salesman. Of course, that one point isn't what made him the salesman he is today, but it only goes to show that the man who thought he never would be a salesman became one when he was started on the right track."

Used to Scatter Himself

"I once thought I wouldn't be any good," said Meck. "Maybe I'm not—but—" he smiled, "—I am kidding the Sennett company into paying me a little money."

"Another thing," Reilly continued, "is concentrating. Charley used to scatter himself all over town. He figured that out for himself and asked me about it. I never had had any plan of that sort, but we proceeded to work one out. He figured out where his prospects lived and found that a big percentage of them were located on the East Side—which is the best part of our town. The others were scattered, and thereafter he spent his time in a section somewhat in proportion to the prospects he had there."

"Yes, that's it," interrupted the Sales Manager. "Your man was a willing worker but didn't know how. Now—the question in my mind—" Jim hitched forward, "—is whether this man Compton is lacking in knowledge of how to work or is just stalling on us. If he is doing that latter, the guillotine for him!"

"That has been done," vouchsafed Meck. "I know territorial men out in my country that might just as well pick out a nice comfortable headquarters and sit down there and write letters to the men they are supposed to see. Some of them are superficial in covering their territory because they have sidelines—tires, garage supplies, chickens—you

know the kind, the unfeathered variety. And some of them just skip along as fast as they can so as not to spend any more time than they have to in the small towns where the sheets are short and the label on the hot water faucet is a damned lie."

"I don't suppose Compton's territory is very desirable so far as traveling is concerned," conceded the Sales Manager.

"It probably isn't any worse than Meck's," challenged Reilly.

Meck Reveals a Few Things

"No, it couldn't be," laughed Meck. "I hit more small towns to the inch than any other man you've got." He flicked the ashes from his cigarette, and seemed to consider fully what he said before he spoke. "I haven't wanted to say anything about Compton, Jim," he said, "for I don't believe in telling tales about people. But I do know something about him and his pedigree."

"Well, out with it, you poor fish," demanded the Sales Manager.

"Don't call him a fish," said Reilly. "I've known some mighty nice fish and they might not like it."

Meck ignored the slam. "Compton," he slowly stated, "was an outside man for the Congress people for two years. He was their big dealer man—that is, he had the best territory. They kept him long after they saw that he was not satisfactory; one reason was that they

didn't want to let him go until they had someone to take his place."

"They offered it to you, of course," said Reilly.

"Oh my, yes!" laughed Meck. "His one failing with them, as with you, was that he covered the ground too fast and didn't produce results. I know him fairly well and, in fact, know of his work when he was a retail salesman in Louisville. There is something amiss with him psychologically. He would go to call on a prospect and somehow or other didn't seem to appreciate the value of the time he was permitted to spend with the man. He always cut his calls too short and didn't get the value out of them.

Underestimated Call's Value

"I imagine that instead of figuring to himself that this call he was about to make was a big opportunity he underestimated its value and, instead of working and scheming to the utmost for ways to make the call most profitable, tried to please the prospect by staying as short a time as possible and apologizing for using up the prospect's time. He was like a fighter who sees an opening and is afraid to put in a punch for fear the other man will get mad and come back at him."

"Like a bill collector without nerve," suggested the Sales Manager.

"There ain't no such animal," said Reilly.

"STOP!" SAYS THE THERMOID RUBBER BIG POLICEMAN



J. E. Duffield, of the Thermoid Rubber Co., Chicago, believes in changing his window display as often as possible and in the past two months has had five different displays. The latest consists of a policeman painted on the inside of the window with 10-inch words, "Are your brakes lined?" as shown herewith. It cost \$10 to have the figure painted. The floor of the window contains rolls of brake lining from the 1-inch to the 12-inch size

Dealer's Legal Status

Supreme Court Holds That Owner Is Entitled to Damages
When Deprived of the Use of Car Through Negligence
of Dealer - Sum of \$1 Held to be Not Enough

By George F. Kaiser

In a recent Connecticut case, where a motorist who had sued a dealer for damages on the claim that his car had been unlawfully detained, the motorist was awarded only \$1 and was given a new trial by the Supreme Court.

The motorist claimed that he had bought the car from the dealer and had paid \$5,096 for it; that it had been kept at the latter's garage, and that while there it was damaged through the dealer's negligence, and that the owner was deprived of its use from August 31 to October 1, 1912. He claimed that the use and enjoyment of the car was reasonably worth \$10 a day and further that he had hired a chauffeur under contract to work until October 1 and that he was compelled to pay him \$67.50 as salary during the period the car was laid up.

The dealer denied everything except the demand and refusal to pay the \$67.50.

The result of the trial was a judgment for the motorist against the dealer in the sum of \$1.

The Supreme Court held that, as it had been shown at the trial that the dealer had already repaired the damaged

car at its own expense, the main question was, whether or not the owner was entitled to recover for the loss of the use and possession of the car while it was being repaired.

The Supreme Court held that this might be permitted, examining authorities in Connecticut, Vermont, Indiana, Missouri, Massachusetts, Michigan, Illinois and some of the United States Courts, which permitted a recovery on that ground.

It was explained that the value of the use of the car during the period it was laid up, and the rental value were not the same, as the latter would include substantial allowances for overhead expenses and the profits of carrying on the business of renting motor cars. As the owner was not engaged in this business, he was not entitled to those profits. The owner being entitled to substantial compensatory damages, insofar as they could be ascertained for the loss of the use of his car, the judgment for \$1 against the dealer was held not to be enough and a new trial was ordered by the court.

You Must Get a Signed Order for Work

The Law Is Against You If You Attempt to Collect and Can
Show No Authority for Doing the Work

Legal Editor, Motor World:

Mr. J. calls at my garage with some machine work and, during conversation, informs me he has just purchased the car he is driving. On numerous occasions this car brings to me various machine work, which is charged to Mr. J., but the car is not driven by him, nor is there any written order on the work, only the instructions by the driver, and not always is the same driver on the machine. On one occasion a tire blew out

while the machine was on the way to my garage, and the driver requested to be given two casings, for which he signed Mr. J.'s name. Now it appears that Mr. J. did not own the machine at any time, but was simply using it to bring work to me (merely a carrier), and that the driver who got the tires was a nephew of the owner of the car but was using the car at that time for Mr. J.'s business. Who is to pay for these tires?

Chicago, Ill.

C. L. V.

The fact that Mr. J. stated to you that he had just purchased the motor car he was driving has no bearing on your claim

for the two casings you subsequently delivered to the driver. Even if Mr. J. had been telling the truth, instead of

boasting, you still would have to show authority on the part of the driver to order supplies, etc., before you would have the right to collect from Mr. J.

As was stated by this Department under date of July 15, 1914: "Wherever possible, the dealer should try to get in direct touch with the car owner and deal as little through chauffeurs as possible, as it always is an open question whether or not a chauffeur had authority to do certain things on behalf of his employer, and when a person is dealing with an agent, he does so at his peril and the courts have said that a person so dealing must ascertain just what authority another's agent possesses. It must be borne in mind that a chauffeur is not presumed to have authority to contract for general repairs and only in cases of sudden or unexpected breakdowns, or 'road troubles,' may the chauffeur bind his employer in ordering such repairs of temporary character, or such necessary supplies as will enable him to continue his journey, but a chauffeur has no implied authority to make contracts for repairs of a general or permanent nature at any time."

Money Should Be Recoverable

This proposition of law is also in your way if you attempt to collect your bill from the true owner of the car, as apparently the driver was not authorized to purchase things on the owner's credit or he would not have used Mr. J.'s name.

You may sue the driver if you wish to, after making an investigation to find out whether or not he is financially responsible, and undoubtedly you will be able to procure a judgment against him for the full amount of the bill.

If it is a fact that the driver used Mr. J.'s name without authority to procure goods from you, with intent to deceive and defraud you, the driver is placed in a serious position. You will be fully justified in taking the matter up criminally and having him arrested, as it would seem that he was guilty of larceny.

If the matter is handled diplomatically I do not think you ought to lose your money. The driver being a nephew of the true owner can very likely get him to pay for the casings. It would only be right and proper for him to pay for them in all events, as the chances are they are being used by him on his car.

Of course, if there was any arrangement between the owner and Mr. J. as regards renting the car, paying expenses, furnishing supplies, etc., that contract would have to be taken into consideration in determining the respective liabilities.

Checking Obviates Mistakes

Simple But Complete System for Keeping Track of Car Movements and Sale of Supplies

While it is not so tied up with red tape as to make it difficult or expensive to operate, the Apthorp Garage in New York City takes every precaution to protect its own interests and those of its customers. It accomplishes its purpose by means of a simple but complete system of records for checking the use of cars and accounting for sales of gasoline, oil and supplies.

Cars are checked in and out of the garage by means of a small card, Fig. 1, which contains a record of the use of a car during a week. These cards are kept in the office of a receiving clerk, at the main entrance to the garage, in a double rack. When the cars are out the cards are placed in the side labeled "Out" and when they are returned the cards are transferred to the rack that is marked "In."

At the end of the week the cards are forwarded by mail to the car owners. They are expected to examine the time indicated by the time clock imprints on the cards and determine whether or not the cars had been in use by them at the times indicated. The A. M. time is indicated on the card with an imprint in

blue and red is used for the P. M. period.

The time imprints on these cards are frequently verified by the proprietors to avoid any possibility that they are "doctored," but the class of patronage is such that they never have any difficulty with "joy riding" chauffeurs, as they are men who enjoy the entire confidence of their employers.

Sales Slips in Duplicate

For charging gasoline to owners of cars on storage, as well as transient sales, duplicate signed sales slips are used. The original goes to the bookkeeping department for charging or posting cash sales, as the case may be, and the duplicate is given to the purchaser. Storage customers are expected to check the charges on their bills for gasoline and oils by means of these slips, Fig. 2.

As a check on the reports from the several floors in the garage of the amount of gasoline on hand, the slips have printed at the top the number of the floor on which the sale was made. A similar sales slip is used in the stock room, and the original (Fig. 3), which goes to the bookkeeper, is not only posted to the account of the customer but is also a means of keeping a record of stock on hand, by charging off on the stock record the items sold.

Building Specially Designed

The Apthorp occupies the 6 floors and basement of a fireproof building, especially erected for garage purposes. Five floors are used for storage of cars in use and they are equipped with wash stands, portable gasoline tanks, pumps for pneumatic cleaning of motors and other apparatus for properly looking after the cars. A portion of the 6th floor has been sub-leased to the owners of a repair-shop, where most of the repairs to the cars stored in the garage are made. The remainder of that floor is used for dead storage. On the first floor are three storage tanks with a capacity off 275 gallons each. The general offices are on the second floor and on the third is a room for chauffeurs.

In the basement is the boiler room,

Fig. 2—These slips are used for sales of supplies, the original going to the bookkeeper for charge sales and the duplicate going to the purchaser

which is built entirely separate from the remainder of that floor. Part of the basement is used for dead storage, and the remainder has a small charging plant, a store room for supplies used in the work of the garage and a locker room where customers keep goods not in constant use, such as extra tires, hampers, clothing, etc.

Card File for Lockers

To keep track of the goods in the locker room, a record is kept on cards 10 x 12 inches. The entries on the cards are made by an employee of the garage who has charge of the record. It is a successful method of avoiding disputes as to what an owner has in the store

Fig. 1—The cards are kept in a rack near the door and the time "out" and "in" of every car stamped on them

Fig. 3—This is the reverse of the card shown in Fig. 1; figures at the top indicate number of times "in" and "out"

room and is easily accessible for the purpose of obtaining any information wanted.

In addition to the space furnished owners in the basement store room, there are lockers, convenient to the position assigned each car, for the storage of clothing in use, tools, etc.

The Apthorp charges are \$40 for open cars and \$45 for closed cars, which include storage, cleaning, locker space, storage for robes, telephone service and other features incidental to the garaging of a car. On dead storage the charge is \$10.

As explained some time ago in Motor World, the Apthorp owners claim that they sustained a loss on storage at \$35 and \$40 and depended for their profits on the sales of gasoline, oils and supplies. They state that if they could induce their customers to pay \$45 and \$50 for storage instead of the present

prices, they could sell gasoline at a profit of 5 cents a gallon and make a greater profit than they now enjoy.

In support of this exhibit, an accountant's report shows a monthly expense of \$4,050. Should they operate the garage to its full capacity—115 cars—every month in the year, which is manifestly an impossibility, the expense per car, based on those figures, would be more than \$35 per month. Should the average fall to 90 cars the cost would be \$45 each, 80 cars \$50 and 65 cars \$65.50 each.

Contrasted with this claim, however, is the B. & B. Garage, in the same section of New York City, where the storage charges for substantially the same service range from \$25 to \$45 monthly, according to the size of the car and the probable amount of care it will require, and yet the proprietor is making money, although he has a capacity of only 25 cars.

Pherson have come to watch for these pictures and each day's offering is scrutinized with interest. Generally Broady manages to work in something about the excellence of Goodrich tires, which the firm sells.

Broady's ability is not due to art schooling, for, he says, "I suppose that I could make cartoons that would present a more finished appearance if I had the necessary schooling, but I am too busy to undertake anything like that at present; therefore we will let nature take its course."

Broady has conceived a character which he styles "Dewdrop." Each day's saying in the cartoon is by Dewdrop, whose bald dome and up-turned nose have become familiar to his friends.

Only One Show in Syracuse

There will be only one show in Syracuse (N. Y.) after all. Although several dealers announced that they would hold a show of their own, the idea has been abandoned and but one show will be held. This is to be under the auspices of the Syracuse Automobile Dealers' Association, in the Armory, February 23-27. An unusual feature of the show will be a display of used cars.

New Haven Show February 22-27

Plans are under way for another automobile show at New Haven, Conn., in the Second Regiment Armory, February 22 to 27, inclusive, under the direction of W. N. Lindsay.

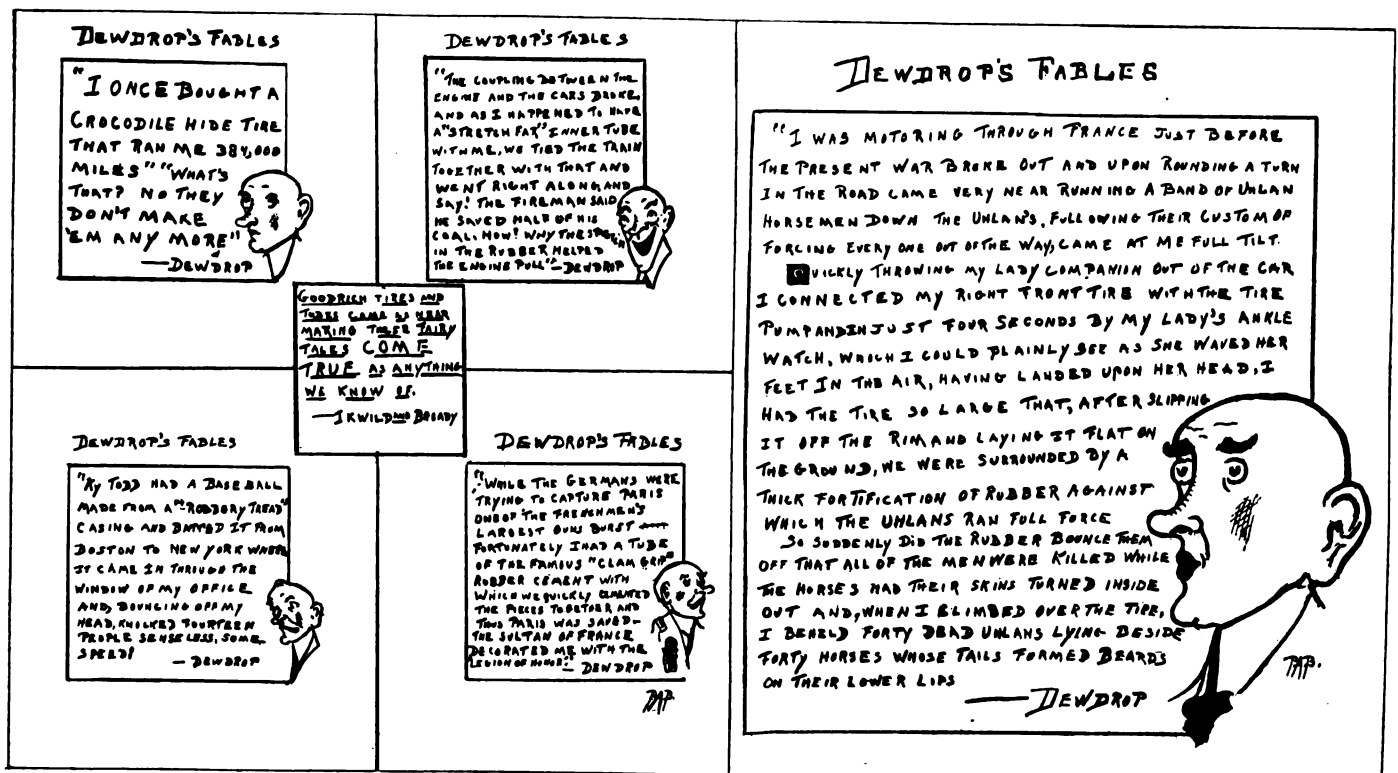
Supplyman is Window Cartoonist Too

Kansas Man Creates Dewdrop, a Very Odd Character

F. N. Ikwild and P. A. Broady, who sell tires and supplies in McPherson, Kan., as Ikwild & Broady, are firm believers in drawing the public eye to their place of business. In this work they possess an able workman in Broady, who is somewhat of a cartoonist and

what is of at least equal importance, knows how to put a sharp point on his productions.

Each day he draws a cartoon, touching on some current event of interest, and hangs the picture with its inscription on the front window. The people of Mc-



The group at the left was one day's offering, on one sheet. Dewdrop is considered somewhat of a Munchausen by his acquaintances but his fables are a never failing source of amusement and attraction

ELECTRIC TOURING DATA IS BROUGHT UP TO DATE

**Ninth Edition of E. V. A. Handbook
Gives Charging Stations and Rates
Within 100 Miles of New
York City**

What may be done in the way of promoting interest in the electric pleasure vehicle and increasing the usefulness of this silent annihilator of space is well brought out by the 1915 and ninth edition of the booklet published by the New York Electric Vehicle Association. In its newly revised form the booklet is utilitarian in the strictest sense of the word.

The booklet is intended primarily for the use of electric motorists in and about New York city and the major portion of it is given over to a comprehensive list of the charging stations within a radius of 100 miles of the metropolis. In addition, these tables give the distance of the various charging stations from Columbus Circle, New York, and in each case (1) the maximum amperage available, (2) the maximum voltage obtainable, (3) the hours during which service is available, (4) the prices charged for boosting, and (5) the cost per kilowatt wherever the latter has been obtainable.

All of these stations are clearly indicated on a map, prepared by the Automobile Blue Book Pub. Co., and furnished as a supplement. A second map gives the charging stations in neighboring states as far north as Pittsfield, Mass., and as far south as Atlantic City, N. J.

Among the other valuable statistics in the booklet, which has 17 pages and is in convenient pocket form, there is a list of distances to various centers in New York city; there is also a tabulation giving typical garage rates in New York for the storing, washing and care of both pleasure vehicles and trucks. The booklet is being distributed to all owners and operators of electric vehicles from the headquarters of the association, Irving Place and 15th street, or from the garage, Central Park West and 62nd street.

Would Restrict Size of Trucks

If the recommendations of the Mayor of New York City carry sufficient weight there may be enacted a law prohibiting the operation in New York of commercial vehicles exceeding 24 feet 6 inches

in length by 7 feet 6 inches in width and 12 feet 2 inches in height. This suggestion comes as a result of investigations carried on by the Mayor's Central Committee on Street Traffic and Safety which met last week and made about 50 recommendations of which this is the most drastic. It is also urged that trucks be compelled to have governors. The

license fee for sight-seeing buses, the committee would have increased from \$10 to \$100.

Republic Truck Cuts Melon

At the annual meeting of the stockholders of the Republic Motor Truck Co., Alma, Mich., February 9, a dividend of 100 per cent was paid.



This is one of the maps in the ninth edition of the booklet published by the New York Electric Vehicle Association. It gives the principal routes and all the charging stations within a radius of 100 miles of New York

QUESTIONS ANSWERED

ALLOYS AND FLUXES FOR SUCCESSFULLY SOLDERING ALUMINUM

Editor Motor World:

What flux do you use when soldering aluminum? I want to solder an aluminum oil base on the bottom of an aluminum crank case. Can I solder galvanized iron on aluminum? If not, what shall I use?

Cummins, Kan.

W. K.

1. There is a variety of aluminum solders to be had. Some require the use of separate flux and others have the flux contained in or intermixed with the solder.

Most aluminum solders are composed of an alloy made from aluminum mixed in varying proportions with one or more of the following metals: zinc, tin, lead, nickel, copper, silver.

Fluxes are necessarily somewhat different in composition accordingly as the alloy used as a solder is soft or hard. That is, accordingly as the solder may be composed of the harder or softer of the metals referred to in the preceding paragraph.

A German authority, Die Gewinnung des Aluminiums, A. Minet, gives zinc, chlorid, mercuric chlorid, tallow, etc., as fluxes for soft aluminum solders and lithium chlorid, borax and fluospar for harder solders. M. U. Schoop patented a flux consisting of fluorides of calcium, potassium, or boron, and the chlorids of alkali metals.

A solder for aluminum which is being used considerably is known as Richard's alloy. Its composition is 22 parts tin, 11 zinc, 1 aluminum and 1 phosphor-tin. This solder requires no additional flux, owing to the action of the phosphorus contained in this solder on the thin film of oxidation which forms on the surfaces of aluminum parts or castings in the process of soldering. The formation of this film is the chief difficulty encountered in soldering aluminum. Its formation is so extremely rapid that it is impossible to effect a union before it makes its effects felt, and the object of the various fluxes is to prevent the formation of the film by protecting the surface of the aluminum from the action of the atmosphere.

2. In the absence of a sketch or more details describing what you wish to do, we cannot offer you any suggestion in answer to this question.

3. So far as present-day experience

will permit a positive statement, galvanized iron can not be soldered to aluminum.

4. This question conveys no idea to us as to just what it is you wish to know.

S. A. E. MOTOR RATINGS

Editor Motor World:

Will you please give me the S. A. E. horsepower rating of the following cars: Ford, Dodge Bros., Reo, Maxwell and Studebaker?

Drummond, Mont.

C. J. Pine.

These S. A. E. horsepower ratings follow: Ford, 22.5; Dodge Bros., 24.22; Reo four, 27.2; Reo six, 30.4; Maxwell, 21.08; Studebaker four, 19.61; Studebaker six, 29.45.

COST OF CHARGING CURRENT

Editor Motor World:

Will you please give me the prevailing rate for charging the batteries of electric pleasure cars and trucks in New York City?

Jersey City, N. J.

J. E. S.

The prevailing rate for current is 10 cents per kilowatt hour except in a few cases, where the rate is as low as 6 cents. In one or two other cases, the rate is 7 cents and 9 cents, respectively. A complete list of all charging stations in New York city and within a radius of about 100 miles of the city, together with rates and hours when service can be obtained, is published in booklet form by the New York Electric Vehicle Association, Irving Place and 15th street; the booklet is distributed gratis.

OILING AND FUEL FEED

Editor Motor World:

What other cars are now using the drive through the rear spring, such as is used on the Dodge Bros. car?

What cars use the same or similar gasoline pressure feed system?

What cars use the North East starting and lighting system?

Is the oiling system different in any great way from other cars? Is it similar to any? Which ones?

Johnstown, Pa.

L. A. Co.

In the Dodge Bros.' car the propeller shaft runs through a tubular member which takes the torque and the drive.

Among the cars driving through the springs are Apperson, Cadillac, Case, Franklin, Haynes, Hudson, Jeffery, Kissel, Marmon, National, Oldsmobile, Peerless, Pierce-Arrow, Reo and Winton. Makers of some of these cars use torque tubes or arms on some models and drive through the springs on others.

Gasoline feed by pressure is employed in many cars, among which are Cadillac, Cole, Fiat, Haynes, Jeffery, Locomobile, Moline-Knight, Marmon, National, Olds, Packard, Peerless, Pierce-Arrow, Simplex, Willys-Knight and Winton. In several cases the makers use other systems in some models.

Splash lubrication in combination with pump circulation is employed by approximately half the cars on the market, others using pressure and splash, pressure without splash and, in a few cases, plain splash without pump. While details differ somewhat in different cars, splash lubrication with pump circulation is used by the Buick, Chalmers, Haynes, Kissel, Oldsmobile, Overland, Peerless, Reo, Simplex, Studebaker, Velie and others.

Among the cars using North East starting and lighting are the Lyons-Knight, Imperial and Krit.

PRESIDENT OF THE A. A. A.

Editor Motor World:

Will you kindly tell me the name and address of the president of the American Automobile Association?

Geneva, Ind.

W. H.

The president of the American Automobile Association is Mr. John A. Wilson, Franklin, Pa.

RACING CAR COOLING SYSTEMS

Editor Motor World:

Will you please tell me what percentage of racing cars use thermo-syphon cooling against the pump system?

Greensburg, Ind.

E. E. A.

The percentage of racing cars in which the thermo-syphon system of water circulation is used is extremely small. In practically every racing car the pump system of circulation is used. The only prominent example of thermo-syphon cooling in a racing car is found in the old Keeton, owned by Robert Burnham and driven by Callahan on the Galesburg (Ill.) track.

Larger Quarters for F & H Wheels

In order to provide for increased manufacturing facilities, the F & H Wire Wheel Co. is moving its plant and offices from Columbus to Springfield, O. The new plant will be considerably larger.

Advanced Maintenance

BRAZING AND WELDING

By George Fernwell

(Continued from last week.)

The various uses of brazing require spelters of varying melting points and also various fluxes and preparations or precautions to avoid undesirable results such as in the case of the warping of a cylinder or a brass casting melting out

be from 30 to 40 inches in length, it can be quickly and uniformly brazed on a charcoal forge by loading the seam with spelter and borax on the inside of the tube and drawing the tube seam downward slowly across the charcoal fire.

stitute, lay spelter uniformly along the bottom of the trough formed by the angle brass, insert the angle brass completely within the tapered tube, the latter seam downwards, and then tilt the angle brass over until the spelter could fall in the required position along and on top of the seam. Fig. 1.

In old-time coppersmith's shops, before the application of illuminating gas to brazing was discovered, work which was difficult to accomplish on the forge was more conveniently heated by varying shapes and sizes of portable furnaces. These were made in two or more sections, so that if it were required to braze a flange of a given diameter on copper tubing, a portable blast furnace of suitable diameter would be clamped together on the pipe, as in Fig. 4.

Gasoline Available Where Gas Is Not

A modern substitute for a blow-pipe using illuminating gas, where the latter cannot be had, is a gasoline brazing equipment consisting of gasoline stored in a pressure tank, and one or sometimes two blow-pipes.

These blow-pipes would be mounted on stationary pedestals, with swiveled clamps so as to permit each blow-pipe

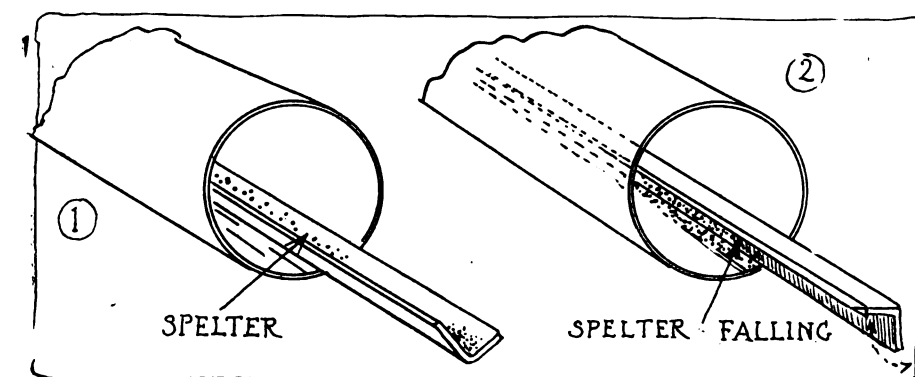


Fig. 1—In brazing a small tube, spelter is put into a piece of angle brass which is turned over after being inserted, allowing the spelter to fall on the seam

of shape during the process of brazing. A further instance mainly affected by the manner in which the blow-pipe flame is directed at the work is that of burning or melting away a part of the wall of a copper tube, especially when the latter is being brazed to a comparatively heavy steel flange.

Experience Needed in Using Coal

Work such as brazing iron or steel in which there is less risk of melting the parts can be successfully accomplished with a blacksmith's forge, using coal. This requires, however, an expert blacksmith's knowledge of how to obtain a clean fire with coal, as an essential condition to effecting a perfect union or adhesion of the flowing spelter with the surfaces required to be united. Clean and strong work may be more easily obtained when using charcoal or coke in a blacksmith's forge in place of coal. Fig. 2 illustrates the conventional coppersmith's brazing forge used for generations before illuminating gas was utilized for brazing. For a great variety of brazing work the old fashioned coppersmith's charcoal forge is still preferable to a gas blow-pipe.

There is an instance in the method of making a tapered manifold tube with a dovetailed and brazed seam as referred to last week. Although this seam may

Brazed in this manner, there should be a practically smooth surface on the inside.

Incidentally it may be mentioned that the method of loading the seam from the inside of a tube of so small a diameter would be to use a length of very small angle brass or sheet metal sub-

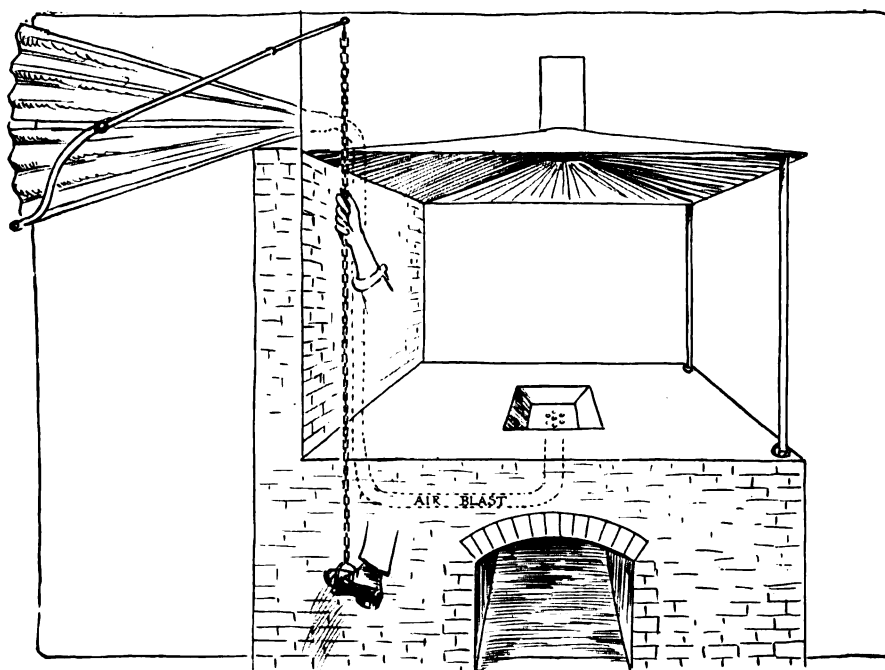


Fig. 2—The conventional old-fashioned brazing forge has a stirrup attached to the bellows chain so the foot can be used for heavy work. The hand is sufficient for light work

flame to be pointed in any desired direction and clamped in that position.

In an outfit of this description, when two blow-pipes are included each is mounted on a separate pedestal in such a manner that flames can be directed on opposite sides of the work to be heated.

For comparatively light brazing work one or sometimes two large-sized gaso-

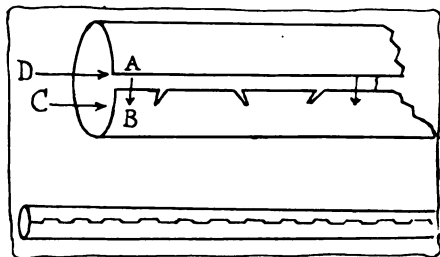


Fig. 3—In making a tube from sheet metal the edges are interlocked by slitting one edge and turning sections alternately up and down and pressing the edges together

line torches may be used with good results, especially if the work is surrounded with charcoal while brazing. A general precaution to take when using a gasoline blow-pipe or a gasoline torch is to regulate the flame so that combustion is perfect or complete, so as to avoid depositing soot upon or oxidizing the surfaces to be brazed.

Taking up in turn blow-pipes for use where gas is available, these may be obtained in a wide variety. For the very lightest work, such as brazing brass unions on copper pipes of small diameter, such as for gasoline supply or

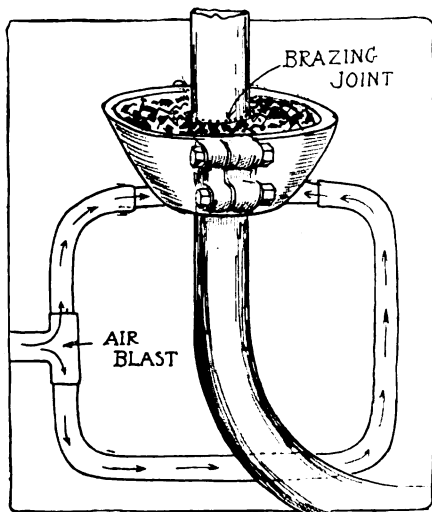


Fig. 4—For brazing a large pipe a portable forge made in sections, is clamped to it

acetylene gas, the blow-pipe such as illustrated in Fig. 5, is so proportioned that with it can be obtained a needle-like flame very suitable for such small work; this makes it possible to heat a comparatively short length or section of the pipe with a minimum risk of burning or even melting the softer metal, that is, the brass union. This can be used with foot bellows or with air blast.

The blow-pipe of such small dimensions and for such light work as described is more conveniently used directly on the work bench rather than on a forge or hearth in some remote part of the shop, if conveniently connected with air and gas supply. If it is desired to supplement the heat of this small blow-pipe by placing some charcoal around the work to be brazed, a cleaner and more convenient material to use than ordinary loose charcoal are the pressed charcoal blocks or cubes, which may be obtained from jewelers' or coppersmiths' supply houses.

The prepared charcoal blocks may be used over and over again and do not give off sparks or make ashes.

Small Blow-pipe Helped by Charcoal

For economical and effective use on making or repairing inlet and water manifolds or exhaust pipes a medium-sized blow-pipe is a very effective appliance. By medium-sized is meant a blow-pipe having $\frac{1}{2}$ -inch air and gas supply pipes.

With this size blow-pipe and with a corresponding size foot bellows and the judicious use of charcoal, there is hardly anything about a chassis which cannot be heated to a brazing temperature. Also with the last named equipment the largest size exhaust pipe tubing ordinarily used may, after tightly packing with sand, be heated to a bright red uniformly along a foot or more in length of the tube ready for bending to a curve of large radius. To be successful, however, in uniformly heating the exhaust pipe along the length indicated it is necessary to pack pipe with charcoal for at least 6 inches beyond each end of the portion required to be heated and to keep the pipe well covered with live or red hot charcoal at one portion while applying the blow-pipe flame to another portion.

Where a blow-pipe is required to answer the requirements of the heavier brazing work, and also for quickly heating such work as bent front axles, a very much heavier blow-pipe, having from $\frac{3}{4}$ to 1 inch gas pipe, may be provided.

Spelter and Its Ingredients

The most powerful type of blow-pipe, it is hardly necessary to add, is the oxy-acetylene blow-pipe. It is worth noting here, however, that with the use of the latter in connection with making manifolds, branches can be brazed or welded to the main pipe without the need of the saddle-shaped flanges being formed in the branches.

Brazing spelter is a term given to alloys of various composition, although spelter was formerly generally understood to be composed of half copper and half zinc, but in later years tin and anti-mony have been used to produce spelters which would melt at much lower temperature, thus lessening the skill required

to braze metals together, the melting temperature of which latter would be very little higher if any than that of the half-and-half alloy of copper and zinc. A table is here appended, reproduced from "Brazing and Soldering":

Brazing Alloys	Tin	Copper	Zinc	Antimony
Hardest	0	3	1	0
Hard (spelter) ..	0	1	1	0
Soft	1	4	3	0
Softest	2	0	0	1

As may be seen by the above table, the hardest spelter contains a comparatively large proportion of copper, in consequence it requires comparatively a

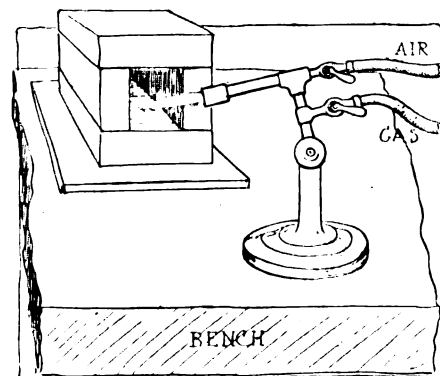


Fig. 5—For small work a gas blow-pipe using illuminating gas is most convenient

very much higher temperature to melt than that which is considered ordinarily a hard spelter composed of equal parts of copper and zinc. The higher temperature to which the parts must be heated to braze them with the hardest alloy increases the risk of burning.

Skillfully performed, brazing with the hardest spelter results in the strongest possible joint that can be produced with spelter. Besides the necessary skill and experience, the conditions of flame and flux and cleanliness must be perfect to permit a thorough amalgamation or union of the spelter with the surfaces to be united.

(To be continued)

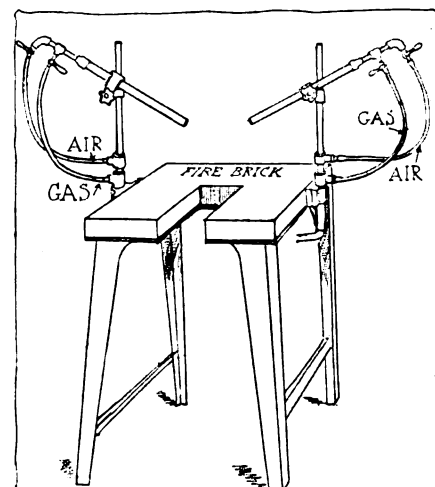
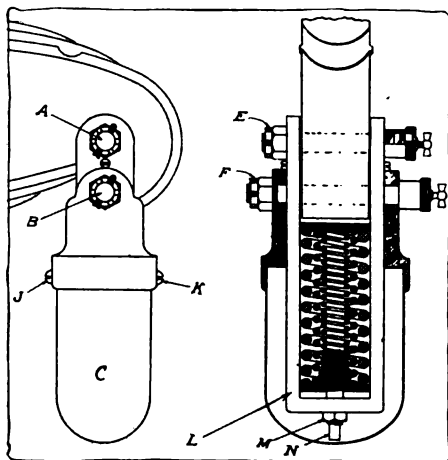


Fig. 6—Heavy work may be done with a pair of blow-pipes supplied with air by power

RECENT DEVELOPMENTS in ACCESSORIES

Cox Triple Spring Shock Absorber

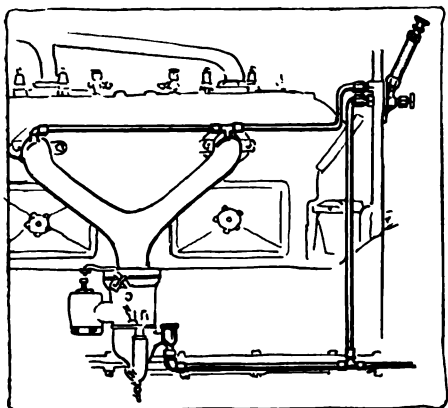
The latest type of Cox shock absorber, manufactured by the Cox Brass Mfg. Co., Albany, N. Y., is the C-C, in which vibration is absorbed by three nested springs of different degrees of resist-



The Cox shock absorber has graduated triple springs nested in a cage

ance. The three springs are enclosed in a single steel casing and act as one.

The springs are carried in a cage, L, having upward extensions to take the spring bolt A, and slots through which the bolt B passes; the bolt B is attached to the down-turned end of the upper leaf spring of the car and both bolts are fitted with compression grease cups



The Imperial primer is operated by a small hand pump on the dashboard

for lubrication. The tension of the springs can be adjusted to suit the individual car by loosening the lock-nut M and turning the screw N, which passes through it, to the left to tighten the spring and to the right to loosen it. The casing C is removed to expose the

adjusting screw by taking out the small screws J and K. Cotter-pins E and F are provided to prevent the nuts backing off the bolts when the car is on the road.

The action of the springs tends to force the bolts A and B apart, and this is resisted by the springs, which are compressed in their cage as the latter ascends, the springs being held back while the slot permits the cage to move.

If the action of the absorber is too stiff it can be eased by removing the inner, lightest spring; this adapts it for light cars. If the springs are too light a heavier outer spring can be substituted for the regular one; this spring is furnished when desired and is painted red as a distinguishing mark. The price of the absorber is \$10 per pair. They can be attached to any car except the Ford.

Easily Installed Priming Pump

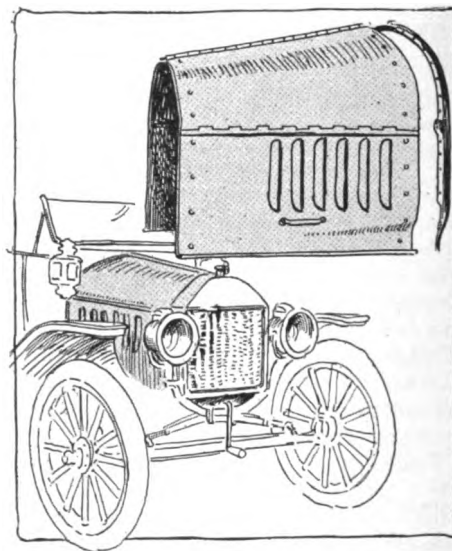
A priming pump that can be attached to almost any car and puts a charge of fuel directly in the intake manifold is manufactured by the Imperial Brass Mfg. Co., Chicago, Ill. It consists of a small plunger pump which is mounted on the dashboard and connected to the main gasoline line by one tube and to the intake manifold by another. The up-stroke of the pump draws gasoline into the barrel and the down-stroke sends it to the intake.

The pump intake is provided with a shut-off needle valve operated by a milled head directly under the pump; the outlet is shut off by turning the pump handle part way around. The pump barrel is 3 inches long and $\frac{3}{4}$ inch diameter and is attached to a flange which screws to the dashboard and carries the shut-off and the two pipe connections. The outfit consists of the pump with all necessary tubing and connections, and the price is \$5. The finish is nickel plate.

Streamline Hood for Fords

A hood which is interchangeable with the regular Ford hood and is built on up-to-date tapered lines, is produced by the Superior Lamp Mfg. Co., New York. It is substantially constructed and fastens by means of the original hooks. The outlines are attractive, there being a taper from the radiator to the top of the dashboard, and the appearance is further improved by the stamping in of six louvers or ventilating slots on each side. These also assist in the cooling

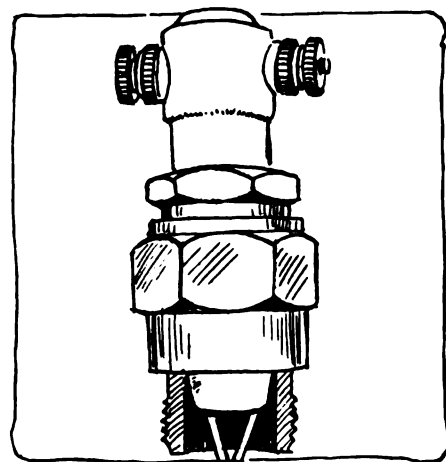
of the motor by allowing heated air to escape. The hood is furnished, finished in black enamel and ready to attach, for \$11.40. A new hood rest is supplied, which is screwed to the dash in place of the original.



Streamline design is one of the features of the Superior Ford hood

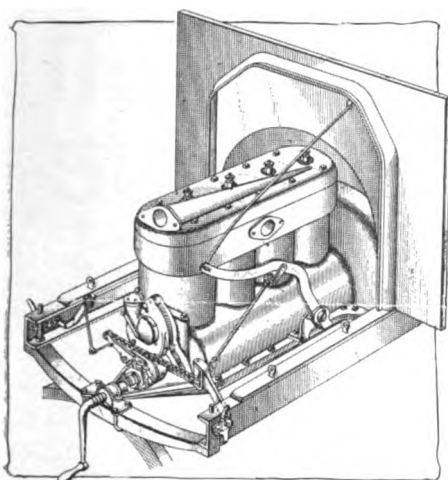
Su-Dig Plug for Series Ignition

A series plug designed for use in two-spark ignition systems, where there are two plugs in each cylinder sparking



Two insulated electrodes are provided in the Su-Dig series plug

simultaneously, is manufactured by the Superior Motor Specialty Co., Philadelphia. This plug will work with any ignition system, battery or magneto, and is intended to be placed between the magneto or coil and the second plug, which may be of the conventional type;



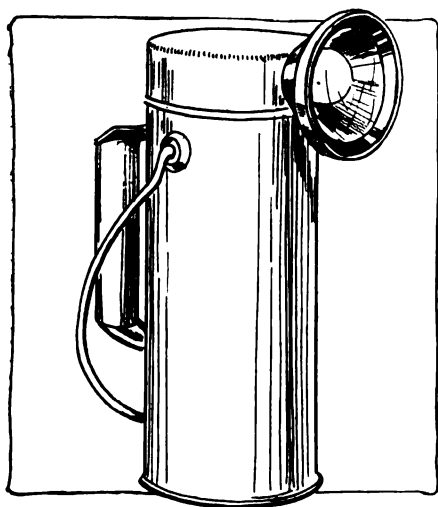
Starting from the seat is effected by the use of the Hunter Ford starter

preferably the series plug is placed over the intake valve and the other in the center of the cylinder head or in the case of a T-head motor, over the exhaust valve.

Heavy porcelain insulation is employed and there are two insulated electrodes with two outside binding nuts; to one is attached the wire from the source of current, while the other takes the wire leading to the second plug; the latter is grounded in the usual way. The plug is made in all sizes; the price is \$1.50. Dealers, f. o. b. Philadelphia 12 plugs, \$1.10 each; 50, \$1.05; 100, \$1. Cash with order or c. o. d. shipment, 99 cents, 94 cents and 89 cents each.

Hunter Starter for Ford Motors

The starter manufactured by the Hunter Auto Supply Co., Chicago, is of the manually operated type with a pull han-



A single dry cell is sufficient to operate the Delta battery hand lamp

dle on the dash which is connected by a flexible rod to a lever which, in turn, is connected to a chain attached to a ratchet lever on the crankshaft at the front of the motor. The rod attached

to the handle applies the pull to the end of the intermediate lever, while the connection from the chain is at the middle of the lever, which greatly increases the leverage available for turning over the motor and makes the operation an easy one. The ratchet is automatic in operation, only engaging when the handle is pulled and throwing out as soon as the first explosion occurs. A spring returns the starter to the first position when the handle is released.

The fitting which carries the ratchet and its lever and pawl is mounted on the end of the crankshaft and the regular starting crank is left in position. It is not necessary to make any holes except the one in the dash through which the pull-rod passes. The handle is polished and nickel plated. The price of the starter complete is \$10.

Delta One-Cell Hand Battery Lamp

A lamp that has been designed throughout with a view to getting the best results from a single dry cell is manufactured by the Delta Electric Co., Marion, Ind. It consists of a cylindrical casing into which the cell fits snugly, a reflector on the side near the top containing the bulb, and two carrying handles, one a bail and the other a stationary handle on the back.

The parabolic reflector is designed to throw a concentrated pencil of light for a long distance, and has a ground and polished lens, which may be had either for concentrating or diffusing the light. The lamp is finished in nickel. Price, with battery, \$1.50; dealers, less than 12, \$1.18 each; per dozen, \$12.84.

Over-Tone Cord-Operated Horn

The Over-Tone hand horn, manufactured by the Overholt Co., Galesburg, Ill., differs from most hand horns in that it is operated by pulling a handle attached to a cord which, in turn, operates the diaphragm-vibrating mechanism. The diaphragm is of Swedish steel and has the usual anvil at its center; the rotor carries at its edge 9 steel washers or strikers, loosely hung, so that when the rotor is rapidly turned they are thrown by centrifugal force against the anvil on the diaphragm.

The drum on which the operating cord is wound is spring mounted; when the cord is pulled it spins the rotor and at the same time winds the spring, and when the cord is released the spring rewinds it and at the same time keeps the rotor turning, so that there is continuous rotation in one direction. The faster the cord is pulled the louder the note of the horn.

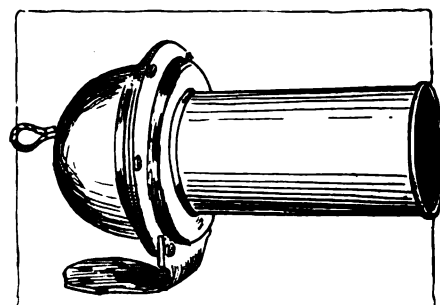
A single size is made, 8 inches long and 4½ inches in diameter, with straight beaded projector and finished in black enamel only. Two types of bracket are made, one straight and the other a right-angle bracket for Fords; the price, which

is the same in either case, is \$3.50. Dealers, \$21 per dozen.

Over-Turn Spring Starter for Fords

An automatically winding spring starter for Ford cars is made by the Overholt Co., Galesburg, Ill. The device can be attached in about an hour, necessitates the boring of but one hole—through the dash—and adds but 45 pounds, to the weight of the car.

The Over-Turn starter is built in a compact unit which attaches to the front of the car after the starting crank has been removed; the gears are completely enclosed, and from the lower part of the casing a shaft projects backward and



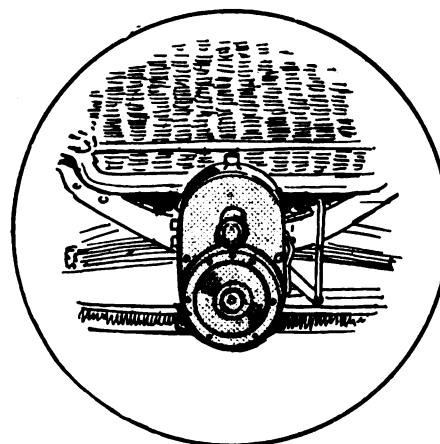
The Over-Tone horn is sounded by pulling a handle attached to a cord

carries the long, heavy coiled wire spring that stores the power. The spring is sufficiently powerful to give the motor several rapid revolutions—enough to start it if it is in condition for starting; the speed is much greater than can be attained by hand cranking.

The spring is released by a trigger on the dashboard when the motor is to be started. The first score of revolutions rewinds the spring ready for another start, the trigger being held during the rewinding. A hand crank is furnished with the outfit to use for trying compression of the motor. The price of the starter complete is \$45.

Wagner Small Battery Charger

A garage convenience that is manufactured by the Wagner Electric Mfg. Co., St. Louis, Mo., is a charging plant for starting-lighting batteries, consist-



A heavy spring, automatically wound, stores energy in the Over-Turn Ford starter

ing of a regulation Wagner generator of the type built for motor car lighting, direct coupled to a Wagner motor, the outfit being mounted on a cast-iron base.

Regulation of the current is automatically attained by the winding of the generator, no extraneous apparatus for the purpose being required. The only attention needed is to plug in and start the plant and to stop it and remove the plug when the charge is complete. Chargers are supplied for either 6- or 12-volt batteries; the 12-volt type will charge two 6-volt batteries in series.

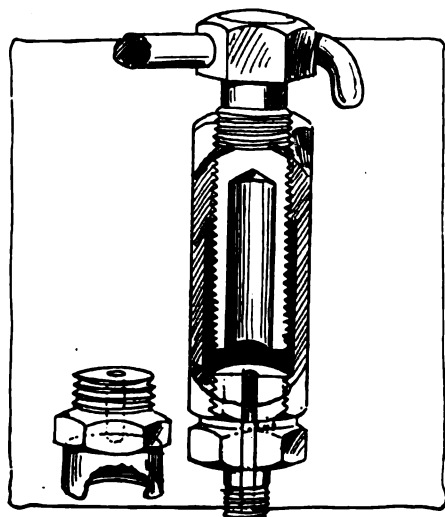
The driving motor may be either a standard Wagner single phase 60 cycle machine, which suits the usual alternating circuits, or a direct current machine for 110 or 220 volts. Simple snap switches control both alternating and direct circuits, and the leads are brought out conveniently so that they can be readily connected up.

The prices are as follows: For 60-cycle alternating current, 110 or 220 volts, 6-volt generator, \$75; 12-volt generator, \$77. For direct current, 110 or 220 volts, 6-volt generator, \$70; 12-volt generator, \$72.

Strickler High-Pressure Grease Gun

A grease gun designed for very heavy pressure and having no tight-fitting piston, but a plunger of the displacement type, is manufactured by T. H. Strickler, Chicago. It is intended to force grease into bearings that have become stuck and clogged so that the ordinary type of gun cannot do the work.

The barrel is of heavy hexagonal steel; the plunger is of slightly less diameter than the cylinder bore, is threaded into the head, the thread being very long in the barrel to ensure long wear, and is bored out to provide an air chamber or cushion. A large hexagon head on the top permits the application of a wrench in extreme cases; ordinarily the plunger is screwed in by means of a short bar which passes through a hole in the hexa-

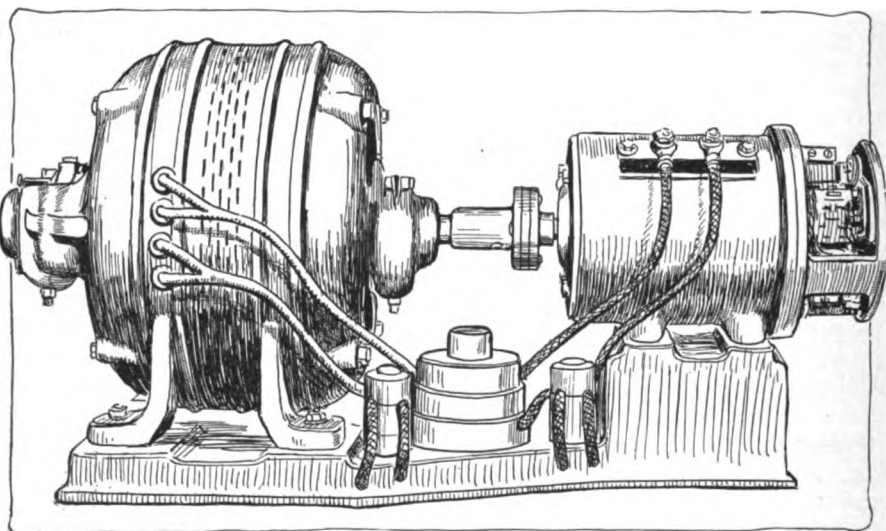


Heavy pressure is applied to grease by the Strickler forcing gun

gon head. The steel used is of high grade and is heat treated.

At its discharge end the barrel is threaded for nozzles which are made in various sizes to screw into all the standard oil cup holes. Nozzles are provided with both internal and external threads, so that all types of cup connections can be handled; 10 different sizes are made, and odd or special threads will be cut at a small additional charge.

To use the gun on a gummed-up bearing, it is filled with grease and the nozzle screwed into the grease-cup hole. Pressure is applied with the bar or, if this is insufficient, the hexagon barrel may be held with one wrench and another applied to the plunger head, which is turned until the grease is forced through, after which the plunger is turned back to relieve the pressure before removing the gun. The air chamber in the plunger prevents damage to the gun.



In the Wagner battery charging set, the generator, at the right, is so wound that the output is automatically regulated to suit the needs of the battery on charge

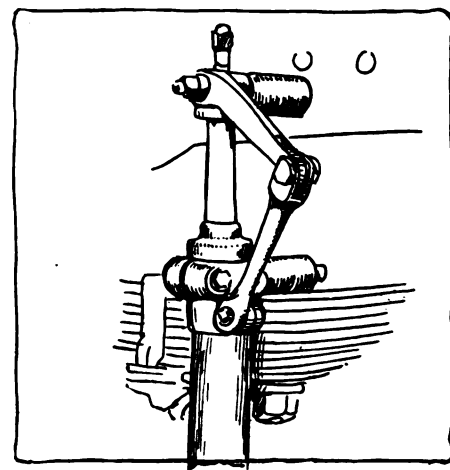
The price of the gun, with one $\frac{1}{8}$ pipe thread nozzle, is \$1.50; dealers, \$1.10. Extra nozzles 35 cents each.

Shock Absorber on New Lines

Construction that is considerably different from ordinary shock absorber design is embodied in the new device of the National Appliance Co., Grinnell, Ia. The Naco shock absorber works by friction, the degree of retardation of spring action being automatically regulated according to the demands made upon it.

A cylinder in which slides a split plunger is attached vertically to the lower spring of the car and an upward extension of the plunger is attached to the upper spring, or, in the case of a semi-elliptic, to the frame above the spring. A pair of hinged arms, positioned like the arms of a friction joint shock absorber, are attached one to the upper and the other to the lower shock absorber brackets.

Movement of the car on its springs



An expanding plunger produces the friction in the Naco shock absorber

causes movement of the plunger and the arms; the lower arm is connected to an expanding mechanism acting on the split

plunger so that the further the arm is moved the more the plunger is expanded and the greater the friction between it and the cylinder. The expander mechanism is adjustable from the outside, so that it can be adapted to the car on which the device is installed. The expanding action is effective for both up and down movements.

Three types are made. For cars from 2,400 to 4,000 pounds, \$36 per set of four; cars under 2,400 pounds, \$30 per set; Ford set, \$18. Rear pair in the two larger sizes, \$18 and \$15.

Perfect Valve Grinding Compound

The valve grinding compound made by the Winton L. Smith Machine Works, Newark, N. J., is packed in collapsible tubes $3\frac{1}{2}$ inches long and $\frac{5}{8}$ inch in diameter, which are put up in standard packages of 1 gross, $\frac{1}{2}$ gross, coarse grain, and $\frac{1}{2}$ gross fine. Price, \$14.40 per gross; dealers, 33 $\frac{1}{3}$ per cent in gross lots.

Dealer Supply House

The RETAIL NEWS



Garage Repair Shop

The E. J. Thompson Co., Pittsburgh, has completed new headquarters. The building is four stories high, of terra cotta, tile, steel and concrete construction. The company will have a floor space of 80,000 square feet and will employ 140 skilled men in season in the building of fine enclosed and open automobile bodies. The officers of the company are: Edward J. Thompson, president and general manager; Wilson S. McCormick, vice-president; James C. Chaplin, treasurer; William P. Knight, secretary; Charles H. Barnard, assistant general manager, and Walter C. Yelton, construction engineer.

The J. I. Case T. M. Co., Racine, has established a wholesale and retail store, service station and display rooms for all products near its downtown works in Racine. Recently the Case company took over the plant of the former Fish Bros. Wagon Co., Racine, and has remodeled the first floor of the State street frontage into a store, where all Case products, from threshing machines to motor cars will be exhibited and sold. The station is in charge of A. J. Kellam, who has been for three years manager of the Case branch at Little Rock, Ark.

E. Mack Morris has taken over the accessory store at 1575 Woodward avenue, Detroit, formerly owned by McLean & Freeman, and has enlarged the stock of automobile supplies, tires and tubes and installed a gasoline and oil station. Morris was connected with the Northern Motor Car Co. until it was merged with the E. M. F. Co., when he became assistant sales manager of that company. Latterly he has been general manager of the Great Western Auto Co., Peru, Ind., resigning to enter business on his own account.

A combination garage and horse barn will be erected by Germaine Bros. on a piece of ground 165 x 65 feet in Traverse City, Mich. On the ground floor there will be the automobile salesroom, garage and repair-shop, and the basement will be the quarters for the horses. A feature of the business will be a semi-monthly auction sale of horses, which, the Germaine brothers think will bring a large number of prospective automobile buyers to their place of business.

A. A. Freund, mechanical manager of the Strubing Garage, and F. F. Fuller, superintendent of the E. & H. Motor Co.'s garage, have organized the Auto Service Co. to do a general machine-shop, blacksmithing, foundry, trimming, body building and painting business. The new concern has taken quarters in the shops of the Jenkins Machine Co., Sheboygan. The company will handle a full line of Ford parts and starting and lighting systems.

The Motor Sales Co. of Grand Rapids is the new name of the Palmer Sales

Co., distributors for Western Michigan for the Paige and Peerless cars. The company controls 21 western counties and Herbert A. Porter is in charge of the sales and service organization and appointing dealers in that territory. Carl P. Palmer, although retaining his interest in the company, is however taking no active part in the selling end.

Under the style Central Motor Car Co., M. E. Biery will occupy the new structure to be erected at the corner of Arch avenue and Prospect street, Alliance, O. The company has the agency for the Brooks touring car and Republic and Grand trucks. The building will be specially equipped for storage service and will have a capacity for approximately 50 cars. Particular attention will be paid to repair work.

The Burkert & Pottinger Co., agent for the Case in Racine, has been absorbed by the W. R. Taylor Motor Co. and the combined interests have taken occupancy of the Burkert garage at Wisconsin and 7th streets, Racine. The agency lines now handled are the Case, Paige, Cadillac, Dodge and Stegeman truck. The business will be conducted under the style W. R. Taylor Motor Co.

A new automobile garage and salesroom will be erected in Zeeland, Mich., for Henry De Kruif, who has been connected for many years with the Isaac Van Dyke Co., dealer in farm wagons, buggies, implements and farm machinery and who also handled the Reo cars. The automobile business has taken such importance that it was deemed advisable to handle it separately.

The Buckeye Motor Co., East Liverpool, O., has located in the new building recently erected for it at Fifth and Walnut streets. The first and second floors are for storage purposes and on the third floor is the repair department and paint shop. The company has the agency for Hudson and Maxwell cars and Packard and Modern trucks. A line of accessories and tires is stocked.

The Morgan Garage & Supply Co., Rhinelander, Wis., is making tentative plans for a large new garage on the site of the present building, to be erected on condition that the local advancement association succeeds in its plan to build a \$75,000 hotel. The hotel proposition has advanced to the stage of planning.

Harry A. Nelson is installed in the new garage in East Eighteenth street, near French, at Erie, Pa. The two-story building, which is 68 x 105 feet, has a display room 35 x 25 feet, offices and storage quarters on the first floor, with the machine-shop on the second floor. He has the Ford agency.

J. H. Lang has leased the Bonde garage at 215 N. P. avenue, Fargo, N. D. In addition to the district management of the Maxwell line he now has the retail territory to care for as well as

the southern half of North Dakota and Montana. He will specialize in Maxwell repair work.

The Culmerville, Russellton & Cheswick Transit Co. has been organized by J. F. McNaul, George E. Evans and A. J. Norris to run an automobile passenger and freight service between Cheswick, Culmerville and Russellton, three miles up the Allegheny river from Pittsburgh.

Richard Watson and George Harris have purchased the interests of George Groebe and J. S. Moore in the Cameron Auto Co., Princeton, Mo. The business will be conducted under the same style, with Moore in charge of the supplies and repair work.

A second floor is being added to the Messner Garage, Benton Harbor, Mich., and a third floor is to be added this summer. Amos Messner, who handles the Overland and Ford cars, states that in 1914 274 Ford cars were sold by the concern.

The Maple City Specialty Co. has been organized by Burton E. Giles and Ralph Cushing in Adrian, Mich., to handle automobile specialties and accessories. Incorporation papers have been filed showing the capitalization to be \$10,000.

The Western Motor Car Co. and the California Motor Co., Los Angeles, both of which are owned by Earl C. Anthony, have been consolidated under the name Earl C. Anthony, Inc. Chalmers, Grant and Packard cars are handled by Anthony.

Goldman & Walton is the name of a new concern formed by Emanuel Goldman and H. H. Walton in St. Louis. They have engaged in the automobile repair business and opened a shop at 5072 Delmar boulevard.

John J. Murphy, proprietor of the Dundee Garage, Dundee, N. Y., has torn down the wooden rear of the structure and will replace it with a concrete fireproof addition, 42 x 90 feet, and a repair-shop 25 x 40 feet.

The Hinckley Motor Sales Co., Grand Rapids, has been formed by M. M. Hinckley and J. E. Beatty, to handle the R-C-H cars. Headquarters have been secured at the Allen & Dorthy garage, Ionia avenue.

Louis Arbs, Chicago, and Edward Buker, mayor of Greenwood, Wis., have established a garage and machine-shop in the remodeled Miller Street Livory building under the style Greenwood Garage & Machine Co.

Gosrud Bros., wagon works, Sturgeon Bay, Wis., who have maintained a small repair-shop for some time, have established a complete garage and machine-shop which occupies a fireproof addition recently completed.

The Firestone Tire & Rubber Co. has

leased a piece of ground 38 x 140 feet at Farnam and 26th streets, Omaha, and has contracted for a three-story and basement building to house its salesrooms and offices.

The Indianapolis Maxwell distributor, the Maxwell Motor Corp., has opened a new salesroom and service station at 541 North Capitol avenue. E. C. Zaring is manager of the retail sales department and R. L. Malcom of the wholesale department. The local service department is in charge of J. F. Requarth and the out of town service will be looked after by C. E. Troutman.

At the annual meeting of the Auto Garage Co., Manistee, Mich., a dividend of 4 per cent was declared and paid. Henry Brugman was elected president; Dr. A. S. Payne, vice-president; T. J. Elton, secretary-treasurer. These officers and Otto Brugman and Alexander Smith form the board of directors.

The McKenney-Devlin Co., 799 Woodward avenue, Detroit, has secured the agency for the eight-cylinder Ross for Detroit and all the counties in lower Michigan. The McKenney-Devlin Co. will continue to handle the Haynes and Grant cars.

The Moritz-Mullin Co., Detroit distributor for Signal trucks, and which also conducted a garage business, has sold the latter business to D. D. Frisbee & Co., a new company recently incorporated with a capital stock of \$25,000.

The Sphinx Motor Sales Co. has been formed in Indianapolis by Harry Hill and D. B. Carter to handle the Sphinx cars in the State of Indiana. Showrooms have been opened at 516 North Capitol avenue.

The firm of McGregory & Ketchum has been formed in Cass City, Mich., by P. S. McGregory and R. L. Ketchum to do a general automobile business. The firm will handle a line of automobiles of moderate price.

Carl Nelson, of Waupaca, Wis., has purchased the Central Garage at Manawa. Nelson was for nine years in charge of the farm machinery and motor car department of A. M. Hansen Co. at Waupaca.

George O. Wildhack, formerly manager of the local branch of the Oakland Motor Car Co., Indianapolis, is now owner of the Wildhack Co., which has secured the agency for the Oldsmobile cars.

The Rempis Garage, Grand Rapids, has been opened for business. It is located on Front avenue, near Bridge street, and besides doing a general garage business is operating a taxicab service.

The Alliance Motor Co., Alliance, O., has elected for this year the following officers: President, C. C. Mummert; vice-president, C. G. Cline; treasurer, J. O. Ellis; secretary, S. L. Geiger.

Palmer & Waterman, general contractors, have leased a building on River street, Battle Creek, Mich., and will remodel it as a garage and salesroom. They will handle the Oldsmobile.

The Toledo-Mercer Co., Toledo, has been formed with Lester C. Bailey as manager. The company will sell the Mercer. Headquarters are located at the Twenty-first Street Garage.

William Wenzel, Marshfield, Wis., is contemplating the erection of a fireproof garage on the site of his present livery stables. The building is to be 44 x 40 feet in size, two stories high.

The Green Bay Motor Car Co., Green

Bay, Wis., has installed a charging apparatus and hereafter will make a specialty of electric car storage and vehicle battery charging and repairs.

The Lincoln Automobile Co. is a new retail automobile concern organized at Somerset, Pa., by the following men: R. L. Richardson, Harvey E. Stahl, J. T. Bowman and W. J. Phillips.

The Packard Motor Co. of Pittsburgh has been organized by the following men to take over the sales of Packard cars in that city: J. A. Lager, R. T. Rossell and E. C. McHugh.

The Wylie Avenue Auto Co., Pittsburgh, has bought the automobile repair-shop and garage owned by the Tyler Automobile Co. and will arrange at once to do mechanical work.

The Motor Car Exchange, Pittsburgh, has been organized by the following men to open a commercial garage on Baum boulevard: R. P. Sullivan, A. E. Kountz and Thomas R. Reed.

Frederick H. Gleason has purchased a plot of ground on East Fifty-sixth street, New York city, on which he will build a five-story garage, the estimated cost of which is \$100,000.

Glenn D. Hills, Studebaker dealer in Marshall, Mich., has purchased the Gardanier livery establishment and is transforming it into an up-to-date garage and service station.

The Seven-Seven Co., Spokane, Wash., has disposed of 190 Dodge cars in the Inland Empire during the past 60 days. W. L. Duffy has been added to the sales force.

The Utterback-Gleason Co., Bangor, Me., has taken the agency for the King car in that section. J. C. Utterback, senior member of the firm, is mayor of Bangor.

An \$80,000 four-story garage, 90 x 112 feet, is to be built on West Dedham street, Boston, Mass. The Tremont Realty Corp. has awarded the contract.

The \$8,500 fireproof garage being erected for the Lyon-Barton Motor Car Co. at 830 Howard avenue, New Orleans, La., is nearing completion.

The Souhegan Automobile Co., Milford, N. H., has taken over the Ford agency for that vicinity formerly held by W. E. Hopkins, of Wilton.

The Strang Garage Co., 18-26 North Nevada avenue, Colorado Springs, has purchased the accessory stock and business of the Paul Auto Co.

A three-story brick garage, 50 x 71 feet, is being constructed for James R. Crelline at Wayne avenue and Washington lane, Philadelphia, Pa.

The H. S. Waite Co., which has taken the agency for the Grant car for New England, has opened salesrooms at 801 Boylston street, Boston.

The Reliable Tire Co., St. Louis, handling tires and tire accessories and also doing a repair business, has moved to 3117 Locust street.

The Wilcox-Crymble Co. has started in the repair business at 238-240 West 53rd street, New York. It will specialize in Delco repair work.

The New England branch of the Knight Tire & Rubber Co. has just been moved from 153 to 179 Massachusetts avenue, Boston.

W. E. Ellis has opened a garage and repair-shop at 225½ North Main street, Findlay, O. He will specialize in vulcanizing work.

The Westinghouse Electric & Mfg. Co. has opened a sales and service sta-

tion in Indianapolis; it is in charge of M. W. Hanks.

The Anderson Tire & Rubber Co. has moved into its new offices and salesrooms at 121 North Lawrence avenue, Wichita, Kan.

Plans have been completed for the erection of a brick addition, 33 x 77 feet, to the garage of L. E. Jeffers, Schenectady, N. Y.

Hugson & Merton, Inc., have been appointed Pacific Coast distributors for the Gray & Davis Ford starting and lighting devices.

Thomas F. Murphy will build a 50 x 100-foot two-story concrete garage at Southbridge, Mass. The estimated cost is \$10,000.

Carl J. Peterson, garage and machine-shop, Grantsburg, Wis., has made an installation of welding and cutting apparatus.

A branch office will be opened in Cincinnati in the Union Central building by the Polack Tire & Rubber Co., New York.

G. M. Trowbridge, of Steptoe, Wash., has closed a contract with the Hodgins-Fosdick Co., Spokane, for the Maxwell line.

The W. S. Russell Co., Boston, has opened an agency for Haynes cars in Lynn, Mass. F. L. Witherell has been placed in charge.

Don Kuhn has purchased M. Seigle's interest in the firm of Seigle & Thomas, automobile dealers of Marcellus, Mich.

The Haskell Garage, 21 Sackett street, Providence, R. I., is planning an addition 40 x 67 feet and a 20 x 30-foot ell.

John S. Mahoney, Wm. C. Nichols and Frank L. Chase have organized the Cut-Rate Taxi line in Spokane, Wash.

The West End Garage & Machine Co. has been organized in Trenton, N. J., to operate a garage and repair plant.

S. C. Thimble, Providence, R. I., has accepted plans for a two-story, 40 x 52-foot, garage on Atwells avenue.

The Grinnell Motor Co., Grinnell, Ill., is erecting a \$7,000 garage, 74 x 100 feet, on Main street, Oskaloosa, Ill.

E. H. McKenzie has succeeded to the automobile accessories business of E. H. Clements, East Chicago, Ind.

The Charles H. Hubbard & Sons Co., Rockland, Mass., have just taken the agency for the Trumbull car.

W. J. Benson has opened a garage on North First street, San Jose, Cal. He has the Maxwell agency.

A \$6,000 one-story garage, 25 x 100 feet, will be erected for the Gray Estate at 25 Bagg street, Detroit.

A \$6,000 commercial garage is being built for J. L. Shortell, 104 South Michigan avenue, Chicago, Ill.

The Overland-Florida Co., Jacksonville, has moved into its new quarters at 314 West Monroe street.

The Goodyear Tire & Rubber Co. has moved into its new quarters at 2549 Farnam street, Omaha.

L. F. Berteau is erecting a 50 x 100-foot garage on North Michigan avenue, Big Rapids, Mich.

J. H. Perry and Richard Hopper are equipping a repair-shop at Springfield, Tenn.

W. R. King & Son, Homer, Mich., have opened a garage and are now selling the Ford.

A new garage is being erected for J. F. Monteith in Elk Rapids, Mich.



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Showroom Ideas

THE showroom containing the cars you have for sale should represent faithfully the business you are seeking.

To explain: Recently in a salesroom in a large city west of the Mississippi the manager had about the worst layout of his cars possible. He was selling high-priced touring cars, which he was vainly trying to sell to the best people in the city, people who own fine homes, are counted among the soundest business interests in the city and who in general are representative of the best class of our citizens.

Simple Change Did Much

His showroom was an oblong with the long side facing the street, giving nearly double the ordinary show space that the average salesroom has. The cars were poorly arranged. First, every car presented exactly the same view to the pedestrian on the sidewalk, to the person passing in a motor car. It was a three-quarter front view. All three cars on the floor looked alike. The impression would have been as strong if only one car were shown. On suggestion one car was placed broadside to the show window, being placed well back from the window so that the spectator could get a good view of the entire body. One other was left three-quarter front; and the third was placed three-quarter rear—an unusual yet very attractive position. This change was worked in less than 5 minutes and yet from the street a new atmosphere was given the place—magnetism was added.

Women are strong factors in buying cars. They tell the men what to buy. This has been true for years with the city buyer and it is just as true today with the farmer buyer.

Suit the Woman

Taking this tip, arrange your salesroom to suit the women; make it attractive to them; make it comfortable to them. If you have not already a small table for the salesroom, with three or four chairs around it, get one at once. It will be an excellent investment. Our women like to sit down while shopping. Our leading dry goods houses cultivate this habit. We should imitate it. Place the table and chairs in such a position that the women can get a commanding view of perhaps three or four cars on the floor, if you have so many; or if you have only one or perhaps two, be sure she gets a good view of one or both.

This table, the rug it is on, and the chairs are strong selling factors, particularly if well placed. But go further: Get an album of photographs showing your car on the prettiest drives around your city, and with real home people in it. There is little attraction in an empty car, but a car well filled with a party of home folks, or perhaps business men, is a real magnet. Try it. Place this album where the woman will see it, where she can look through it at leisure. She sees your car on the very drives on which she hopes her neighbor may see her after she buys. Such photographs are potent factors in closing a car sale. They are often more potent in aiding the buyer to decide on a certain model than minutes of ineffectual arguments by the salesman.

White Floors

It is almost impossible to make all colors in cars look well excepting on a white floor. White adds materially to a car's appearance, whether the car be painted black, green, blue or red. White is about the only color that serves well for all colors. It is a little hard to keep clean, but to offset this it is very easily cleaned, and in our cities there generally is a porter around who can use the mop effectively every 15 minutes or half hour. Other colors on the floor may give a certain effect, but in general they are not so effective as white. The red tile floor is effective if plenty of light is used, if it is kept spotless, and if relieved by a little green, a fern or something of the kind.

An attractive salesroom does not mean an expensive one. Men are not accustomed to placing a chair in the parlor at home, or suggesting the color of a room, and yet all of a sudden these men set themselves up as judges on finishing a salesroom. What could be more preposterous? It would be much better to consult your wife, your mother, or your sister. Get advice from a decorator in a department store, in a house furnishing store, or if you live in a large city, from a decorator. It will prove worth while.

UNION OF WASHINGTON'S DEALERS MOVES SLOWLY

**Amalgamation of Two Associations
Seems More Remote Than Ever—
No Show Likely to Be Held
This Winter**

The prospects for the amalgamation of the Washington Automobile Dealers' Association and the Automobile Trade Association of Washington, the two dealers organizations of the city, seem further away now than ever before. Various attempts have been made by individuals in both organizations to bring about a situation under which an amicable working agreement could be agreed upon, to be followed later by an amalgamation, but these individuals seem to have given up their efforts in discouragement.

The differences which stand in the way of one big organization being formed result from the varying views held by the older and the younger men in the trade. A general disposition to give and take in connection with a possible single organization has been sadly lacking, according to some of those who have taken an interest in such an organization.

The Washington Automobile Dealers' Association has held two shows to date. The Automobile Trade Association of Washington has held a carnival, conducted as a rival attraction to one of the shows held by the other organization. No show or carnival is expected to be held this winter by either organization, and for the reasons suggested above—the inability of the conflicting elements to get together. The individual dealers, therefore, seem to have about made up their minds to sit steady in the boat, look after their own particular interests, and see what the future brings.

H. B. Leary, Jr., Washington representative for the Maxwell line, revived the carnival spirit by holding a show in his salesrooms the past week. All of the 1915 models were on exhibition, including the roadsters, touring cars, cabriolets and town cars. A feature was one of the Maxwell motors, showing the working parts. A. P. Roberts, of the Maxwell Motor Car Co., Detroit, assisted in the exhibition.

U. S. Tire Men Discuss Conditions

Officers of the United States Tire Co. and all branch managers met February 9 in conference at the Detroit offices of the company and at the plant of Morgan & Wright to discuss business

conditions, to outline the policy for the year and to exchange views and ideas. Besides discussing business matters, the visitors spent a day at the Morgan & Wright plant. Among those who were in attendance were: E. S. Williams, president of the United States Tire Co.; M. Tucker, secretary to the president; George Shugart and O. S. Tweedy, western sales managers; Edward McMaster, manager manufacturing department; C. J. Butler, president Morgan & Wright; Joseph Weston, sales manager; Charles Case, from the general offices, New York; William McMahan, factory manager of Morgan & Wright, and the following branch managers: Colburn Standish, Detroit; F. B. Godloe, New York; Samuel Pool, Philadelphia; Edward Kidder, Boston; E. W. Tozier, Chicago; L. A. Brown, Kansas City; P. C. Anderson, Memphis; C. C. Gehring, Pittsburgh; P. Goodall, Cleveland; Charles Gilbert, San Francisco; F. R. Burton, Atlanta; H. H. Hubbard, St. Louis; J. M. Ward, Indianapolis.

Five-Passenger Jones Six at \$1,150

The Jones Motor Car Co., Wichita, Kan., is now engaged upon the production of the Jones six, which is assembled from standard parts and which will sell for \$1,150 in five-passenger touring form. The equipment includes Leece-Neville electric lighting and starting and all the usual fittings. The motor has T-head cylinders $3\frac{3}{8} \times 4\frac{3}{8}$, thermo-syphon cooling, Remy distributor ignition, Stromberg carbureter with vacuum feed, and combination splash and pressure lubrication. Transmission elements include a steel cone clutch, a four-speed selective gearset bolted directly to the motor and final drive through a single universal. The drive is taken through three-quarter elliptic rear springs and tires measure 34 x 5.

St. Joseph Show Draws 5,000

The St. Joseph, Mo., automobile show closed February 6, with an attendance estimated at about 5,000, of which fully one-third were out-of-town visitors. All told, during the four days of show probably 18,000 persons saw the 1915 models. Dealers claim that the attendance was fully 100 per cent better than last year, and some even say 200 per cent. Actual sales are estimated all the way from 150 down to 25 cars, one dealer actually showing the contracts for six cars sold while another had sold five. Briefly stated, it was a good business show, better than had been expected.

Detroit Branch Office for Thermoid

The Thermoid Rubber Co., Trenton, has opened a branch office and service station in suite 1435 Dime Savings Bank building, Detroit. William E. Carpenter, Joseph H. Liston and Harry R. Portugal will be in charge.

HIGH WHEAT PRICE AND BIG CROP HELP DEALER

Grain Country Car Merchandisers Already Feeling Loosening of Stringency—Follows Three-Year Poor Crop

With May wheat close to \$1.60 and cash wheat at about the same, dealers in Nebraska, Kansas and other wheat states are beginning to feel the coming of better business. This is especially true in Southern Kansas, where the farmers apparently have let go of some cash wheat, says H. Earl, a traveling representative of the Moon Motor Car Co.

The average yield in Nebraska is about 18 bushels to the acre; this year it is 30 or 32, and this heavy harvest follows three years of poverty crops. Also, the normal price is about 75 cents a bushel, but the demands of Europe have sent May wheat to a high figure, and the farmers are hanging on for a still higher figure. Russia, which is a large grain producer, cannot export due to war conditions and this helps hold the price. When it was falsely reported some time ago that the Allies had captured the Dardanelles, wheat immediately dropped 10 cents.

Another phase is that of the wheat country merchants. They have been obliged to carry their trade on credit during much of the three bad wheat years, but with these accounts being paid with the wheat money, they are eligible motor car prospects. The merchants have not lacked money; their capital has merely been tied up.

St. Louis Dealers Tackle Used Cars

The St. Louis Automobile Manufacturers and Dealers Association proposes to adopt an appraisement plan as a means of solving the used car problem. The plan, in brief, is to have an experienced man appraise every used car offered in trade even where the car is offered in part payment for a new car of the same make. Each dealer would be required to submit to the association appraiser the price at which he sells every used car and these prices would be used as a basis upon which he would work. The plan is almost exactly similar to the one which already has been perfected and adopted with a great deal of success by the Chicago Automobile Dealers Association in its quarterly Central Market Report. The Chicago association has begun the nationalizing of its report, in which work St. Louis may co-operate.

RHODE ISLAND MEN JOIN IN TRADE ORGANIZATION

**Take Part in New England Movement
and Form United Motor Industries
of Rhode Island—Goodby
Made President**

Rhode Island men engaged in the motor car industry have joined in the wave of organization that has been sweeping over New England during the new year, and now The United Motor Industries of Rhode Island has been brought into being. It is made up of motor car dealers, garagemen and tire and accessory firms throughout the state. This new organization is the first one of its kind in the state and it will act as a sort of board of trade for the industry, which is spread over an area not so scattered as in states which embrace a larger territory.

At the initial meeting, 63 of the 75 present joined the new organization, and other members will be added next week. The officers chosen are: President, Albert E. Goodby, of the Goodby-Rankin Co., Providence; vice-presidents, Frank F. Kellogg, Providence Auto Equipment Co.; Charles F. Thatcher, Aetna Bottle and Stopper Co., Buick dealer; William S. Achorn, Crown Garage; treasurer, Charles A. Paine, Belcher & Loomis Hardware Co.; secretary, Henry Corp. Corp Bros., all of Providence; directors, Frank Crook, Pawtucket; John R. Magee, Bristol; Bernard Morgan, Newport; H. L. Capron, Attleboro; A. B. Smith, Westerly; L. M. Jackson, G. H. Gifford, Charles R. Manchester, Herbert A. Thayer, John O'Donnell, Frank A. Glover, William Hughes, all of Providence; William A. Flinn, Narragansett Pier.

Tire Price Revision Continues

The revision of tire lists still continues, though not all manufacturers have as yet been heard from. Since last week two more makers have announced revised lists, these being Diamond and Lee. The new lists, together with the

old ones on some of the more popular sizes, are given herewith.

The list of makers who have revised their schedules following the revision made by Goodrich now includes Diamond, Braender, Firestone, Fisk, United States, Goodyear, Kelly - Springfield, Ajax and Pennsylvania. The companies which have not yet made formal announcement include Batavia, Federal, Miller, Republic and some others.

Iowa Dealers Studying Used Cars

As is the case in so many other sections of the country, Iowa dealers and garagemen are carefully studying the used car problem with a view to adopting some method which will be of benefit. The Iowa Automobile Business Association, Des Moines, of which N. T. Miller is secretary, is actively pushing the work. The plan is to obtain from as many members as possible the average price at which used cars are sold, so that dealers will get a better idea what to allow for them when they are taken in trade. At the same time, the association is operating a credit rating bureau from which much good has come, and a series of weekly noon-day luncheons has been inaugurated at which the dealers get together and discuss their problems in open forum. As the result of a one-day campaign for new members, eight firms have been admitted to membership, bringing the present list up to 40 members.

New England Dealers Organize

Dealers and garage proprietors from Portsmouth, Dover, Exeter, Rochester, Somersworth and Newmarket met at the Sinclair Inn, Portsmouth, N. H., this week to form an organization. The following were elected officers: President, J. W. Edwards; secretary-treasurer, Clifford Loud. A committee comprising Charles E. Woods, of Portsmouth; Albert Wetherell, of Exeter, and George C. Welch, of Dover, was appointed to draft by-laws and arrange for a name. Other officers will be chosen at a later meeting. The new organization may become affiliated with the state association formed a week ago at Manchester, N. H.

BASIS FOR OPTIMISM IN STATISTICS OF FINANCE

Money Is Accumulating and Steel Corporation Has Large Unfilled Orders—Motor Trade Stocks at Higher Figures

That there is an exceedingly tangible basis for the increasing spirit of optimism in this country is indicated by an investigation of statistics in business and financial circles. Despite the granting of foreign loans, money is accumulating; the National banks have just reported a surplus reserve of more than half a billion dollars. Gold is coming into the country. The home trade improvement is marked.

There was a January increase of more than 400,000 tons in the unfilled orders of the steel corporation. There has been a striking advance in many security values, not a few of which are in the motor car and allied industries. In the table of motor car securities quotations which appears this week in Motor World there are a number of notable increases over the quotations of a year ago. Ajax-Grieb common has advanced from 200 to 250; Firestone common from 260 to 370; General Motors common from 59 to 94; Goodrich common from 24 to 33; Kelly-Springfield common from 48 to 112½; Maxwell common from 5 to 22¾; Maxwell first preferred from 27 to 61½; Maxwell second preferred from 8 to 25; Studebaker common from 28 to 46¾; Willys-Overland common from 66 to 95½.

The farmer is facing an unusual situation. For three years the wheat crop has been poor; this year there was a bumper crop, and with the bumper crop has come a very high price, all of which has planted optimism in the hearts of the western dealers. While a universal calamity, the European war has served to create a great demand for American products and activity with good prices is almost bound to result. Legislation has taken a turn which is looked upon with favor by business.

REVISED PRICES OF LEE AND DIAMOND TIRES FOLLOW DOWNWARD MOVEMENT

	30 x 3		32 x 3½		34 x 4		36 x 4½	
Lee	New	Old	New	Old	New	Old	New	Old
Plain	\$9.45	\$12.40	\$14.05	\$17.75	\$20.40	\$25.85	\$28.80	\$37.10
Non-skid	13.15	16.60	20.40	24.70	27.40	33.10	40.20	50.20
Plain P. P.	18.45	20.15	25.50	28.35	34.45	38.25	44.80	49.75
Non-skid P. P.	22.15	25.15	31.85	36.30	41.45	47.00	56.20	64.95
Tube	2.75	3.25	3.30	4.55	4.70	5.75	6.10	7.60
Diamond								
Plain	9.00	11.70	13.35	16.75	19.40	24.35	27.35	35.00
Non-skid	9.45	12.65	14.00	18.10	20.35	26.05	28.70	37.10
Tube	2.35	2.80	2.80	3.70	4.00	4.90	5.20	6.45

MORE PEOPLE AND MORE BUSINESS AT TROY SHOW

Sales Numerous at Collar City's Fifth Annual Function — Attendance Greater by 200—Forty-six Exhibitors

The fifth annual automobile show of the Troy Automobile Dealers association, Troy, N. Y., was brought to a close at Bolton Hall Saturday night, and during the closing ceremonies it was announced that it was the most successful exhibit ever held in the Collar City from the dealers' point of view.

Frank M. Baucus, who managed the exhibit, stated that it was the best show ever held, not from the point of attendance, but from sales that were made. In addition, the paid admissions this year exceeded the total of last year by 200. Every local dealer reports an exceptionally good business, and next year Bolton Hall will be enlarged so that the floor will probably be the largest in northern New York. It was definitely announced that the show would be repeated next year.

There were 41 different makes of cars on exhibit and 46 exhibitors. In all, there were 88 cars. The average attendance each day was between 800 and 1,000 people. There were 45 booths on the great floor, and firms from Albany, Plattsburgh and Schenectady, as well as some from the smaller up-state towns, were represented with exhibits. Sixteen accessory exhibits aided in making this year's show one of the most complete ever held in this section.

There was a record-breaking attendance of 1,500 on the opening night, and though the reported financial depression gave dealers the impression that the show might fall behind in the number of sales made, sales held good all through the week.

30,000 at Wilmington's First Show

Wilmington's first automobile show—and incidentally the first held in Delaware or on the peninsula between the Delaware and Chesapeake bays—which held the center of the stage the first four days of last week, was such a great success that it has been practically decided to have one on a larger scale next year.

The total attendance for the four days is estimated at 30,000, the average being upward of 7,000 a day. The large attendance, however, is partly accounted for by the fact that no admission was charged.

In preparation for next year's show, and also for general business reasons, the exhibitors held a banquet February 12 and effected temporary organization

by electing J. H. Nixon temporary president and H. N. Partington temporary secretary. They will call an organization meeting in a few days.

The exhibition, which was held in the Hotel du Pont, was admirably arranged. There were 28 exhibitors, 15 showing pleasure cars, three showing motorcycles and 10 showing accessories. No trucks were shown.

The following exhibitors report sales: Harry R. Loose, (Oldsmobile), one; G. Parke Postles (Chandler), four; Cahill & Co. (Dodge), four; Gomery-Schwartz Co., two; Diamond State Auto Co. (Paige), three. All of the exhibitors, including those who do not report sales, agree that the show was a great success and that they have benefited.

NEW YORK FIRE MARSHAL'S OFFICE IS ABOLISHED

Albany, N. Y., Feb. 16—Governor Whitman today signed the bill abolishing the office of state fire marshal. This in effect removes from office Fire Marshal Ahearn and puts an end to the regulations which he promulgated several months ago and which imposed a heavy burden on the dealers and garagemen of the entire state outside of Greater New York. Following the promulgation of the regulations the motor car trade associations brought organized opposition to bear, with the result that the rules were temporarily suspended.

Hartford Show Draws Well

The eighth annual automobile show of the Hartford Automobile Dealers Association which was brought to a close last week was one of the best shows ever given by Hartford dealers. The show committee announces that from present indications a dividend of 50 per cent will be returned to exhibitors. Attendance throughout the week was good. Most of the dealers report a good business during the show and all dealers report better prospects than ever.

Large Attendance at Louisville

Secretary Phil Longest of the Louisville Automobile Dealers Association states that the attendance at this year's annual show was about 35,000 people, of which 20,000 were paid admissions. In 1914 the paid admissions totaled 10,000. The sales at the show were at least 50 per cent better than at the former show.

Studebaker Earnings \$4,000,000

The Studebaker Corp., Detroit, is reported to have earned \$4,000,000 in 1914. After taking out the \$900,000 for the preferred stock dividend, \$3,100,000 is left for the common, or approximately 11 per cent on the \$27,931,600 outstanding. This compares with \$1,003,338, or 3.59 per cent, for the common in 1913.

WISCONSIN'S CIRCUIT OF SHOWS IS IN FULL SWING

Eau Claire and Marinette Held Last Week—Exhibits Are Successful—Duluth and Superior on Next Week

Wisconsin's show circuit, a series of local shows in the centers of population in the various sections of the state, is now in full swing. Last week, from February 9 to 13, the Eau Claire and Marinette shows, representative of the northwestern and northeastern sections, respectively, held the boards.

The Eau Claire show this year was one of the largest and most successful of the smaller expositions. It was held in Fournier's academy from February 9 to 12 inclusive. Eau Claire is nearer Minneapolis than Milwaukee and its show was held during the week following Minneapolis. It was the second annual exposition and conducted through the combined efforts of the seven largest agencies in Eau Claire, namely: Tanberg Auto Co., Jordan Auto Co., Taylor Motor Car Co., Chippewa Valley Auto Co., Darwin Motor Co., Hobbs Supply Co. and Barker Auto Co.

Eau Claire is the central car market for 15 northwestern Wisconsin counties, and, as a year ago, many sub-agencies were parceled out and a good many retail sales closed during the four days' exhibition.

The Marinette show was a Twin City affair, dealers in Marinette and Menominee, Mich., across the river, joining in an exposition in the National Guard Armory in Marinette. There were seven exhibitors, as follows: Dugas Motor Car Co., Paige; Union Car Sales Co., Cadillac, Cole and Buick; Auto Service Co., Overland and Hudson; Thomas Howatson, Auburn; Ford Garage, Ford; Twin City Auto & Tire Co., Ford.

During the week of February 22 the second annual Twin Ports show will be held at Duluth, Minn. Duluth dealers join with those of Superior, Wis., in an annual show, held alternately in each city. This year's show will be held in the Duluth Auditorium.

New Cleveland Oakland Distributer

The Oakland Motor Car Co., Pontiac, Mich., has placed its Cleveland and Pittsburgh branches in the hands of the Adams-Oakland Co., Cleveland. H. M. Adams is vice-president and general manager. Fred C. Wood, who has been representative of the factory in both the Cleveland and Pittsburgh territories, though no longer directly connected with the branches, remains with the parent concern. The territory includes nearly every county in Ohio and Pennsylvania.

PROMINENT MEN OF TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve to Place Many Workers in New Places—Few of Them Leave the Industry

Sidney W. Walton has severed his connections with the Packard Motor Car Co. and is succeeded by **Jesse G. Vincent** as vice-president for engineering.

Walter M. Towne, formerly with the Ajax-Grieb Rubber Co., is now a general sales representative of the F. E. Castle Co., manufacturers representative, Detroit.

J. H. Liston has been appointed manager of the Detroit office of the Thermoid Rubber Co., which has recently been opened in the Dime Savings Bank building.

Kenton Harmon has been appointed Metropolitan District Manager for the Dort Motor Car Co., Flint, Mich. His headquarters will be at 1790 Broadway, New York.

J. K. Taylor has been appointed office manager for Smalley Daniels, with headquarters in Detroit. At the same time **A. M. Camis** has been made Chicago sales representative.

Lester F. Rogers, for some time with the Henley-Kimball Co., Boston, selling Hudsons, has resigned to go with the New England branch of the Winton company in that city.

E. A. Kelley, until recently manager of the Chicago branch of the Splitdorf Electrical Co., has been appointed manager of the Apple Electric Co., 972 Woodward avenue, Detroit.

W. B. Dean has become affiliated with Smalley Daniels, manufacturers' distributor, Detroit, and will have charge of the jobbers' department. Formerly he was purchasing agent for the Hearsey-Willis Co.

H. L. Sinclair, formerly in charge of the motor truck department of the Peerless Motor Car Co. in Boston, has become affiliated with A. W. Flinn, of Providence, and they will handle the new worm-driven Chase line in the Boston territory.

Guy C. Core has been appointed advertising manager of the Sparks-Withington Co., Jackson, Mich. Core is a former Chicago newspaper man and for the last three years has been connected with the automobile department of the Chicago Daily Journal.

William A. Perrette, formerly manager of the Michigan branch of the Dunlop Tire Co., Detroit, and also connected for several years with the Diamond Rub-

ber Co. and the Empire Tire Co., has been appointed manager of the Detroit branch of the Republic Tire Co.

George B. Grant, until recently superintendent of agencies of the Oakland Motor Co., has become a member of the Pittsburgh Apperson Co., and will have supervision and appoint agents in Western Pennsylvania, Eastern Ohio, Western Virginia and part of Western Maryland.

BILL WOULD ELIMINATE MANY BUILDING INSPECTIONS

A one-inspector building supervision in Greater New York is provided in a bill which has been introduced in the New York state legislature and which is favored by the motor trade of the metropolis; it would place all building inspections, such as health, tenement, building, and fire prevention, under one head, and would place in each borough an officer who would be supreme in his borough.

At present the owner of a building must submit to many inspections, but under the proposed law one inspection would cover everything; the bill is Introductory No. 449, introduced by Senator Lockwood. This measure is fathered by the real estate interests in New York city.

There is also the Elkus bill in the lower house, which provides for placing under a single head the building supervision of the whole city; the trade does not regard this measure so favorably. Hearings have been held in the Municipal building before the city's building commission, and before this body President R. H. Johnston, of the Automobile Dealers' Association of New York city, and the Automobile Trade Association of New York State expressed the motor trade's views on the inspection question.

Motor Car Securities Quotations

	Feb. 13, 1914	Feb. 13, 1915
	Bid Asked	Bid Asked
Ajax-Grieb Rubber Co., com.	200	250
Ajax-Grieb Rubber Co., pfd.	98	101 100
Aluminum Castings, pfd.	87	100 95
Chalmers Motor Co., com.	85	90 94
Chalmers Motor Co., pfd.	92	91 94
Firestone Tire & Rubber Co., com.	260	370 375
Firestone Tire & Rubber Co., pfd.	105	107 100
General Motors Co., com.	50	61 94 95
General Motors Co., pfd.	89	91 95 95 1/2
B. F. Goodrich Co., com.	24	25 33 33 1/2
B. F. Goodrich Co., pfd.	90	91 95 1/2 97 1/2
Goodyear Tire & Rubber Co., com.	215	225 190 194
Goodyear Tire & Rubber Co., pfd.	88	100 101 102
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	5	5
International Motor Co., pfd.	15	15
Kelly-Springfield Tire Co., com.	48	50 112 1/2 113
Kelly-Springfield Tire Co., 1st pfd.	115	125 84 85
Kelly-Springfield Tire Co., 2nd pfd.	115	125 121 124
Maxwell Motor Co., com.	5	5 1/2 22 1/2 23 1/2
Maxwell Motor Co., 1st pfd.	27	27 1/2 61 1/2 62
Maxwell Motor Co., 2nd pfd.	8	8 1/2 25 25 1/2
Miller Rubber Co., com.	100	158 165
Miller Rubber Co., pfd.	100	101 103
Packard Motor Car Co., com.	25	26 92 100
Packard Motor Car Co., pfd.	55	55 92 100
Peerless Motor Car Co., com.	15	25 15 21
Peerless Motor Car Co., pfd.	75	80 55 55
Portage Rubber Co., com.	40	40 30 36
Portage Rubber Co., pfd.	40	40 80 85
Reo Motor Truck Co.	7 1/2	8 1/2 11 1/2 12
Reo Motor Car Co.	17 1/2	18 1/2 24 1/2 25 1/2
Stewart-Warner Speed Corp., com.	55	58
Stewart-Warner Speed Corp., pfd.	97	100 100 1/2 102
Studebaker Corp., com.	28	30 46 1/2 47
Studebaker Corp., pfd.	85	87 95 96 1/2
Swinehart Tire & Rubber Co.	69	71 69 71
T. S. Rubber Co., com.	59	60 56 1/2 57 1/2
T. S. Rubber Co., pfd.	101 1/2	102 102 103 1/2
White, pfd.	105	110 108 110
Willis-Overland Co., com.	94	98 95 1/2 97 1/2
Willis-Overland Co., pfd.	91	95

SPARTON BESTS KLAXON IN DEALER'S HORN SUIT

**Court Rules That Same Points Were at Issue in Klaxon-Newton Action—
New Evidence Told Too Technical**

The Klaxon-Sparton suit, which was the real issue in the case of Lovell-McConnell Mfg. Co. vs. Garland Automobile Co. in New York City, has been won on appeal by the Garland company; this company, a dealer, had sold Sparton horns, made by the Sparks-Withington Co., Jackson, Mich., and had been sued by Klaxon as an infringer of the Klaxon patents, numbers 923,048, 923,049 and 923,122.

The Garland company won in the lower court and Klaxon appealed to the United States Circuit Court of Appeals for the second circuit. Judge Cox in the opinion stated that all the claims at issue were also the claims which were at issue in the recent Klaxon-Newton case, and said:

"Having so recently passed upon the questions now involved and having denied a petition for a rehearing, we cannot, of course, reverse our decision unless some new and controlling evidence is presented. Indeed, as we understand it, the complainant does not ask or expect us to do this, but contends that new and highly persuasive evidence which is now presented for the first time demonstrates that Hutchison has made a highly meritorious invention. The complainant seeks to differentiate the present from the former case by asserting that 'the infringing device is different, is less complicated and is more like the plaintiffs.' . . . 'The only feature which distinguishes this case from the Newton case is the testimony of Professor Webster describing certain tests and explaining the photographic tracings taken by him of the actual movement of the diaphragms in controversy. These experiments show learning and ingenuity and are interesting from a scientific point of view, but are too technical and refined for practical application to the present controversy. . . .

"In short, we think the test proposed by the defendant too technical for practical adoption in patent cases. It would, if permitted, enable the patentee to contend successfully that, although his combination is shown in the prior art, he is entitled to a monopoly because he uses better material, because his machine is on a much larger scale, and is more scientifically constructed than the one which preceded it. Conceding all that Professor Webster says to be true, we do not think it requires a modification of our former decision. If all the new testimony had been in the former record the result would have been the same."

Sell Heads Greensburg Dealers

The Independent Automobile Association met in the offices of the Penn Motor Sales Co., Greensburg, Pa., and effected a permanent organization. The following officers were elected: President, J. B. Sell; vice-president, L. L. Lowe, Youngwood; secretary, J. A. Eisaman, Greensburg; treasurer, W. M. Fletcher, Penn Motor Sales Co.

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT											
K	4-4½x5½	Spldf	Zenith	A-Lite	Diak	3	116	34x4	1,785	.....	.....
L	4-4½x5½	Spldf	Zenith	A-Lite	Diak	3	121	36x4½	2,085	.....	2,085
F	6-3½x5½	Rosch	Zenith	A-Lite	Diak	4	130	35x4½	2,190	2,190	2,290
H	8-3½x4½	Battery	Zenith	Remy	Diak	4	116	34x4	1,685	.....	.....
ALLEN											
34	4-3½x5	Waths	Stmbg	Waths	Cone	3	110	32x3½	895	895	.....
ALTER											
4-37	4-3½x4½	Remy	Holley	Remy	Diak	3	106	30x3½	685	685	.....
APPERSON											
4-40	4-4 x5	.....	.....	.....	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	.....	.....	.....	Band	3	120	36x4	1,685	1,685	.....
6-60	6-4½x5	.....	.....	.....	Band	3	120	36x4	2,200	2,250	2,350
6-45	6-3½x5½	.....	.....	.....	Band	3	122	34x4	1,485	.....	.....
ABBENZ											
1915	4-4½x5½	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,835	.....
ARGO											
Argo	4-2 5-16x4	A. Kent	Argo	.....	Cone	2	90	28x2½	295	.....	.....
AUBURN											
4-36	4-3½x5	.....	Rafid	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	.....	Rafid	.....	Cone	3	128	34x4	1,550	.....	.....
6-47	6-3½x5½	Bosch	Rafid	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN											
66	6-4½x6	Waths	Master	Waths	Diak	6	141	34x4½	3,600	3,600	3,600
BAUER											
B	4-4½x5	Mea	Shblr	Emran	Diak	3	110	34x3½	875	1,000	.....
BRISCOE											
B	4-3½x5½	Spldf	.....	Apico	Cone	3	107	30x3½	785	785	.....
BUICK											
C-34-5	4-3½x3½	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	Delco	Marvel	Delco	Cone	3	130	36x4½	1,650	.....	1,650
CADILLAC											
51	8-3½x5½	Delco	Own	Delco	Diak	3	122	36x4½	1,975	1,975	1,975
CARTER											
9	4-3½x5	Delco	Shblr	Delco	.....	106	33x4	.....	1,250	.....	.....
CASE											
35	4-4½x5½	Bosch	Rafid	Waths	Diak	3	120	35x4½	1,600	.....	.....
40	4-4½x5½	Bosch	Rafid	Waths	Diak	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	Waths	Stmbg	Waths	Diak	3	115½	34x4	1,250	.....	.....
CHADWICK											
19	6-5 x6	Bosch	Own	Waths	Band	4	.....	37x5	5,500	5,500	5,500
CHALMERS											
26-B	6-3½x5½	A. Kent	Rafid	Entz	Diak	3	125½	34x4½	1,650	1,725	.....
M-6	6-4 x5½	Bosch	Rafid	Entz	Diak	4	132	36x4½	2,400	2,400	.....
32	6-3½x5	A. Kent	Rafid	G & D	Diak	3	120	34x4	1,400	.....	.....
CHANDLER											
15	6-3½x5	Bosch	Rafid	G & D	Diak	3	120	34x4	1,295	.....	.....
CHEVROLET											
H-4	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	.....	875	.....
H-2	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE											
4-40	4-4½x5½	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,965
6-51	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	Delco	Stmbg	Delco	Cone	3	136	37x5	2,465	2,465	2,465
CRAWFORD											
6-35	6-3½x5	Waths	Stmbg	Waths	Diak	3	120	34x4	1,850	1,850	.....
CROW											
E-42	4-4 x5	G & D	Shblr	Emran	Diak	3	114	33x4	1,150	1,165	.....
E-52	4-4½x5½	G & D	Shblr	Emran	Diak	3	120	34x4	1,475	1,600	.....
E-62	6-3½x5½	G & D	Shblr	Emran	Diak	3	130	36x4	1,895	1,895	.....
C.E.Jr	4-3½x4½	Disco	Holley	Disco	Diak	3	104	30x3½	725	.....	.....
CUNNINGHAM											
8	4-4½x5½	Undec	Stmbg	Undec	Diak	3	129	37x5	.....	.....	3,750
CYCLEPLANE											
Tour	4-2½x4	A. Kent	Own	.....	Diak	3	108	28x3	350	.....	.....
Trav	2-3½x4	A. Kent	Shblr	.....	.....	2	96	28x2½	250	.....	.....
DAVIS											
38-A	4-3½x5	Waths	Stmbg	Waths	Cone	3	112	34x4	1,235	1,235	.....
6-D	6-3½x5½	Bosch	Stmbg	G & D	Diak	4	128	37x4½	2,185	.....	.....
DETROITER											
C	4-3½x5	Remy	Stmbg	Remy	Diak	3	112	32x3½	.....	985	.....
DILE											
A	4-2½x4	Bring	Holley	.....	Diak	3	96	28x3	485	.....	.....
DODGE											
...	4-3½x4½	Elsmn	Own	N E	Cone	3	110	32x3½	.....	735	.....
DORRIS											
1A-4	4-4½x5	Waths	Stmbg	Waths	Diak	3	121	36x4½	2,200	2,250	.....
DORT											
Four	4-3 x4	Conn	.....	.....	Cone	3	.....	36x3	495	.....	.....
Five	4-3½x5	Conn	.....	.....	Cone	3	.....	36x3½	680	.....	.....
DRIGGS-SEABURY											
C	4-2½x4	Mgnto	.....	.....	Cone	2	100	28x3	385	.....	.....
A	4-2½x4	Mgnto	.....	.....	Frn Trs	109	.....	.....	385	.....	.....
EMPIRE											
31-40	4-3½x4½	Remy	Holley	Remy	Diak	3	108	32x3½	975	975	.....
ENGER											
6-50	6-3½x5	A. Kent	Rafid	G & D	Diak	3	125	34x4	1,495	.....	1,495
FIAT											
55	4-130x170	Bosch	Own	Waths	Diak	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	Bosch	Own	Waths	Diak	4	135	37x5	5,150	5,150	5,150
54	4-110x150	Bosch	Own	Waths	Diak	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS											
82-E	4-4½x5½	Spldf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	.....
90-E	6-4½x5½	Conn	Rafid	G & D	Diak	3	132	36x4	2,500	2,550	.....
FORD											
T	4-3½x4	Ford	Holley	.....	Diak	2	100	30x3	440	490	.....
FRANKLIN											
6-30	6-3½x4	Elsmn	Own	Dyneto	Diak	3	120	34x4½	2,150	2,150	.....
F. R. P.											
45-B	4-4 3-5x6	Bosch	Stwrt	Bosch	Cone	4	110	36x4	All bodies to order	.....	.....
GLIDE											
30	4-3½x5	Waths	Shblr	Waths	Diak	3	114	32x4	1,195	1,195	.....
GRANT											
M	4-2½x4	Swiss	Mayer	A-C	Cone	2	90	28x3	425	.....	.....
T	6-2½x4½	A. Kent	Mayer	A-C	Cone	3	106	30x3½	.....	795	.....
GREAT WESTERN											
A	4-4½x5½	Kingstn	Kingstn	G & D	Cone	3	117	36x4	1,710	1,710	.....
B	4-3½x5½	Kingstn	Kingstn	Bosch	Cone	3	117	34x4	2,200	.....	.....
HALLADAY											
6-40	6-	Waths	Stmbg	Waths	Diak	3	.....	34x4	.....	1,385	.....
HAYNES											
30	6-3½x5	Remy	Rafid	L-N	Diak	3	121	34x4	1,485	1,485	.....
31	6-4½x5½	Simms	Stmbg	L-N	Band	3	130	36x4½	2,250	.....	2,250
33	6-3½x5	Remy	Rafid	L-N	Diak	3	127	35x4½	.....	1,550	.....
32	4-4½x5½	Simms	Stmbg	L-N	Band	3	118	34x4	.....	1,680	.....
HERFF-BROOKS											
4-40	4-4½x5	Bosch	Stmbg	Apico	Cone	3	118	34x4	1,100	1,100	.....
6-50	6-4 x4½	Bosch	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	.....
HERRESHOFF											
4-16	4-2½x3½	A. Kent	Ctrr	Dyneto	Cone	3	94	28x3	500	.....	.....
HUDSON											
6-40	6-3½x5	Delco	Zenith	Delco	Diak	3	123½	34x4	1,550	.....	1,550
6-54	6-4½x5½	Delco	Zenith	Delco	Diak	4	135	36x4½	.....	2,350	.....
HUPMOBILE											
H	4-3½x5½	Bosch	Zenith	Waths	Diak	3	106	33x4	1,050	1,050	.....
K	4-3½x5½	A. Kent	Zenith	Waths	Diak	3	119	34x4	1,200	1,200	1,225
IMPERIAL											
64	4-3½x5	A. Kent	Stmbg	G & D	Diak	3	115	32x3½	.....	1,685	.....
56	6-3½x5½	Spldf	Stmbg	N E	Diak	3	130	36x4½	.....	2,300	.....
66	6-3 x5	.....	.....	.....	Diak	3	.....	33x4	.....	1,285	.....
INTER-STATE											
T	4-3½x5	Remy	Shblr	Remy	Cone	3	110	33x4	.....	1,000	.....
JACKSON											
46	4-4½x5½	Remy	Shblr	A-Lite	Cone	3	117	34x4	1,375	1,375	.....
46-8	6-3½x5	Delco	Stmbg	Delco	Cone	3	125	34x4½	.....	1,650	.....
JEFFERY											
Four	4-3½x5½	Bosch	Rafid	U S L	Cone	4	116	34x4	1,525	1,450	.....
Six	6-3½x5½	Bosch	Rafid	U S L	Diak	4	133½	34x4½	.....	2,400	.....
Chfld	6-3 x5	Bosch	Stmbg	Bljr	Diak	4	123	34x4	1,650	1,650	.....
KEARNS											
L	4-2½x4	Bring	Zenith	A-C	Cone	3	100	28x3	450	.....	.....
KING											
...	4-3 15-16x5	A. Kent	Stmbg	W. Lnrdr	Diak	3	113	33x4	1,075	1,075	.....
...	8-2½x5	A. Kent	Zenith	W. Lnrdr	Diak	3	113	33x4	.....	1,350	.....
KISSEL											
4-36	4-4½x5½	Waths	Stmbg	Own	Cone	3	121	34x4	1,450	1,450	1,550
6-42	6-3½x5½	Waths	Stmbg	Kissel	Cone	3	126	34x4	1,650	1,650	1,650
6-48	6-4 x5½	Mea	Rafid	Kissel	Cone	4	132½	36x4½	2,350	2,350	2,350
6-60	6-4½x5½	Bosch	Rafid	Kissel	Cone	4	142	37x5	3,150	3,150	3,150
KLINE											
6-42	6-3½x5½	Waths	.....	Waths	Diak	3	123	34x4	1,750	1,750	.....
6-42A	6-3½x5½	Waths	.....	Waths	Diak	3	127	35x4½	.....	1,850	.....

	Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT	O M	4-3½x4 4-3½x4	Disco Boesh	Johann Stmbg	Disco N E	Diak Diak	3 3	108 108	32x3½ 32x3½	850 985	850 985	....
LAMBERT	48-C 68-C	4-3½x4 4-4½x5½	Brggs Brggs	Sbblr Sbblr	Brggs Brggs	.... ....	.. ..	112 117	32x3½ 34x3½	.... 1,585	1,200 1,585	....
LENOX	Four Six	4-4½x5½ 6-3½x5½	Weths Weths	Own Own	Weths Weths	Cone Cone	3 3	118 130	34x4½ 34x4½	.... ....	2,000 2,465	....
LEWIS	...	6-3½x6	Brggs	Stmbg	Remy	Diak	3	135	36x4	1,600	1,600	....
LEXINGTON	Four 6-L 6-M	4-3½x5½ 6-3½x5 6-4½x5	Weths Weths A. Kent	Sbblr Sbblr Stmbg	Weths Weths Jesco	Diak Diak Cone	3 3 3	115 128 130	34x4 34x4 36x4½	1,375 1,875 2,575	1,375 1,875 2,575	....
LOCOMOBILE	M-5 R-5	6-4½x5½ 6-4½x5	Boesh Boesh	Own Own	Weths Weths	Diak Diak	4 4	140 132	37x5 37x5r	5,100 4,400	.... 4,400	5,100
LUVERNE	760	6-4 x5	Boesh	Sbblr	Jesco	Diak	3	128	36x4½	....	....	2,500
LYONS-KNIGHT	K-4	4-4½x5½	Simms	Stmbg	N E	Diak	3	130	37x5	....	2,900	2,980
MARION	... ... ...	8-3½x4½ 6-3 x5 4-3½x5	Boesh Boesh Boesh	.... .... ....	G & D G & D G & D	Diak Diak Diak	3 3 3	115 122 115	34x4 34x4 34x4	1,500 1,250	1,500 1,350....	....
MARMON	41 48	6-4½x5½ 6-4½x6	Boesh Boesh	Stmbg Zenith	Boesh Roth	Cone Disk	3 3	132½ 145	36x4½ 37x5r	3,250	3,250	3,350 5,000
MAXWELL	25	4-3½x4½	Simms	Kngstn	Simms	Cone	3	103	30x3½	725	750	....
McFARLAN	T X	6-4 x6 6-4½x6	Weths Weths	Stmbg Stmbg	Weths Weths	Cone Cone	3 3	132 132	36x4½ 35x4½	2,590 2,900	2,590 2,900	2,590 2,900
McINTYRE	25 6-40	4-3½x5½ 6-3½x4½	Boesh Brggs	Stmbg Stmbg	G & D Brggs	Cone Disk	3 3	106 130	32x3½ 35x4	.... ....	850 1,275	....
MERCER	Spdstr Rdstr	4-3½x6½ 4-3½x6½	Boesh Boesh	Zenith Zenith	U.S.L. U.S.L.	Diak Diak	4 4	130 130	34x4½ 34x4½	2,750 ....	.... 3,000	....
METEOR	42 45	4-4 x5 6-3½x5	A. Kent A. Kent	Stmbg Stmbg	Spldf Spldf	Diak Diak	3 3	114 126	34x4 35x4	.... ....	1,075 1,395	....
METZ	22 25	4-3½x4 4-3½x4	Boesh	Own A. W. T.	G & D G & D	.... ....	.. ..	96 106	30x3 32x3½	495 ....	.... 600	....
MITCHELL	Four Six 7-8 5-8	4-4 x5½ 6-4 x5½ 6-4½x7 6-4½x6	Conn Conn Remy Remy	.... .... .... ....	Spldf Spldf Remy Remy	Cone Cone Cone Cone	3 3 3 3	116 128 144 132	34x4 36x4 37x5 36x4½	1,250 1,585 1,895	1,250 1,585 2,350 1,895	....
MOLINE-KNIGHT	... 40	4-4 x6 4-3½x5	Boesh Conn	Sbblr	Wgner	Cone Cone	4 3	128 118	36x4½ 31x4	2,500	2,500 1,475	2,500
MONARCH	Six	6-3½x5	A. Kent	Zenith	W. Lnrd	Cone	3	125	33x4	....	1,250	1,275
MONROE	M-2	4-3 x3½	Conn	Zenith	A-Lite	Cone	3	96	30x3	460	....	....
MOON	4-38 6-40 6-50	4-3½x5 6-3½x5 6-3½x5½	Delco Delco Delco	Rafid Rafid Rafid	Delco Delco Delco	Disk Disk Disk	3 3 4	122 122 130	34x4 34x4 35x4½	1,350 1,575 2,150	1,350........	....
MORSE	D	4-4½x5	Eismn	Stmbg	G & D	Diak	4	127	36x4½	3,600	3,600	3,600
NATIONAL	AB	6-3½x5½	Eismn	Rafid	Weths	Cone	3	134	36x4½	2,375	2,375	....
NORWALK	F	6-3½x5½	A. Kent	Rafid	G & D	Diak	4	131	37x4	1,875	....	....
OAKLAND	37 49 Spdstr	4-3½x5 6-3½x5 4-3½x5	Delco Delco Delco	Marvel Johann Marvel	Delco Delco Delco	Cone Cone Cone	3 3 3	112 123½ 112	33x4 35x4½ 33x4	1,150 1,100	1,200 1,685
OGREN	Six	6-3½x5½	Boesh	Rafid	B-Rahmr	3	2,500

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Motor Car Agencies Recently Established

COMMERCIAL		
CALIFORNIA		
Place	Car	Dealer
Los Angeles	Koehler	W. S. Sparks

COLORADO		
Denver	Walker	E. M. Jackson

CONNECTICUT		
Hartford	G. M. C.	The Keeney Garage

IOWA		
Cedar Rapids	Nevada	Blake Auto Co.
Webster City	G. M. C.	Hanson & Tyler Auto Co.

KENTUCKY		
Louisville	Republ.	P. M. Andriot & Sons
Louisville	U. S.	Louisville Auto Exchange

MASSACHUSETTS		
Boston	Carford	R. E. Taylor Co.
Boston	Willis-Utility	R. E. Taylor Co.
Boston	Denny	Denny Motor Truck Sales Co.
Boston	Peerless	Beacon Motor Car Co.
Monson	Koehler	Monson Garage
Worcester	Vim	F. S. Howard

MICHIGAN		
Detroit	O. K.	Arthur Power
Marshall	Argo	O. L. Linn & R. S. Scott
Saginaw	Argo	Electric Vehicle Service Co.

MISSOURI		
St. Louis	Knox Tractor	West End Auto Rep. Co.

NEW YORK		
New York	Denny	Denny Motor Truck Sales Co.

OHIO		
Cleveland	Millburn	H. D. Haupt
Columbus	Koehler	Miller-Main Garage

PENNSYLVANIA		
Reading	Koehler	S. A. Sehn

TENNESSEE		
Nashville	Republ.	Hatsfield Auto Co.

TEXAS		
Houston	Vim	Magnolia Motor Sales Corp.

UTAH		
Ogden	G. M. C.	Fell-Wright Co.

PASSENGER CARS		
ARKANSAS		
Fort Smith	Franklin	J. Witherspoon

CALIFORNIA		
Arbuckle	Kissel	A. J. Atran
E. Auburn	Kissel	O. E. Thomas
Los Angeles	Simplex	Simplex & Mercer Pacific Coast Agency

Los Angeles	King	English Motor Car Co.
Los Angeles	Ohio	Washington St. Electric Car
Marysville	Kissel	Marysville Garage
Oakland	Ohio	Huey-Hood Motor Car Co.
Riverside	Kissel	Fairmount Garage & Mch. Wks.
Sacramento	Oldsmobile	F. C. Peters
San Francisco	Simplex	Simplex & Mercer Pacific Coast Agency

CANADA		
Berlin	Regal	L. C. Browne
Calgary	King	Diamond Motor Car Co.
Chatham	Ford	J. M. McColg
Hamilton	Chandler	F. G. Morris
London	Oldsmobile	London Motor Sales Co.
London	Franklin	London Engine S. Co.
Midway	Regal	G. Kuneman
Midway	Saxon	Huntley & Reuber
Montreal	Grant	Legare Gaultois, Ltd.
Montreal	Hupmobile	The Coner Motor Co.
Montreal	Grant	Carreau Motor Car Co.
Montreal	Briscoe	Laussier Garage, Ltd.
Port Arthur	Franklin	D. Boreau
Port Arthur	Saxon	Central Garage
Quebec	Moon	Le Page Co.
Regina	King	Wright & Mitchell
St. John	Oldsmobile	New Brunswick M. Car Co.
Sarnia	Oldsmobile	R. Milligan
Sault Ste. Marie	Regal	G. P. Black
Sherbrooke	Reo	R. A. Webster
Toronto	Oldsmobile	Croftan Storage Battery Co.
Toronto	Peterson	F. A. Harvey
Toronto	Simplex	Thompson

COLORADO		
Denver	King	Mid West Auto Sales Co.

CONNECTICUT		
Greenwich	Detroit	Enders & Abrams
Hartford	Davis	Asylum Hill Garage
Hartford	Davis	J. C. Collins
New London	Oldsmobile	J. B. Getchell
Stamford	Lexington	The Motor Sales, Inc.

GEORGIA		
Atlanta	Remington	Arlington Motor Co.

IDAHO		
Twin Falls	King	F. A. Nelson

ILLINOIS		
Altamont	Case	F. Schlottbeck
Anna	Oldsmobile	R. Tutill

Place	Car	Dealer
Bloomington	Davis	Davis Motor Car Co.
Chicago	Simplex	Tennant Motor, Ltd.
Chicago	Lexington	T. C. Vawter
Creston	Case	Louis Vesta
Decatur	Davis	F. M. Webb
Effingham	Metz	G. F. Walters
Elkville	Pullman	C. T. Bass
Elmhurst	Metz	A. V. Wallace
Minonk	Davis	Minonk Central Garage
Morrison	Franklin	O. Woods
Mt. Carroll	Case	W. E. Brown
New Baden	Pullman	J. J. Kock
Noble	Metz	E. Warren
Oak Park	Davis	W. A. Pillinger
Pekin	Davis	Pekin Palace Livery Co.
Pontiac	Case	W. Alge
Pontiac	Davis	C. C. Johnson
St. Jacobs	Pullman	St. Jacobs Hardware Co.
Springfield	Lexington	H. Haas Elec. & Mfg. Co.
Stanford	Davis	Stanford Auto Co.
Sycamore	Case	Loptien Bros.

INDIANA		
Crawfordsville	Saxon	Arnold, Hill & Turpin
Dyer	Case	Fitch Bros.
Indianapolis	Cole	Cole Sales Co.
Lafayette	Saxon	Columbia Tire & Auto Co.
Morland	Davis	M. A. Clark
Pendleton	Davis	J. Banefel
Tipton	Davis	J. E. Lower

IOWA		
Burlington	Lexington	Farmers Motor & S. Co.
Conrad	Case	Case Motor Car Co.
Conroy	Lexington	Geiger & Martinson
Davenport	Mitchell	McGivern Motor Co.
Fairfield	Oldsmobile	E. S. Thomas

Coming Events

Feb. 22, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Feb. 25, New York, N. Y.—S. A. E. Metropolitan Section meeting; report of Research Committee on Kerosene Carbureters. Research Committee report on Non-Electric Continuous-Torque Transmission.

Feb. 27, San Francisco, Cal.—Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Mar. 3, Albany, N. Y.—United Garage Associations of New York State, general convention.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.

June 9, Galesburg, Ill.—Two-mile track meet.

June 16, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Association.

June 25, Sioux City, Ia.—Track meet.

July 4-5, Tacoma, Wash.—Speedway Races.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 20-21, Elgin, Ill.—Road race.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

THE SHOW CIRCUIT

Feb. 15-20, Tacoma, Wash.—Show; A. L. Sommers, manager.

Feb. 15-20, Greensburg, Pa.—Westmoreland Auto Dealers Association show; Armory.

Feb. 15-20, Grand Rapids, Mich.—Automobile show, Klingman Furniture Exposition Building.

Feb. 15-20, Bridgeport, Conn.—Show; Armory.

Feb. 15-20, Omaha, Neb.—Show, Auditorium, C. G. Powell.

Place	Car	Dealer
Fort Madison	Glide	Winks Bros.
Keystone	Imperial	Miller & Shreeves
Lansing	Case	Hufschmidt & Wendel
Mason City	Imperial	Snyder & McCall
New Hampton	Davis	J. L. Curtis
Toledo	Franklin	Jones Bros. Auto Co.
Westgate	Imperial	Tegmeier Bros.

KANSAS		
Argonia	Case	Achelpohl & Bringer
Great Bend	Imperial	E. E. Cook
Hutchinson	Case	E. H. Steinfeld & Rexorad Engineering Co.
Independence	Oldsmobile	R. A. Stone

KENTUCKY		
Winchester	Case	Peoples Motor Car Co.

MASSACHUSETTS		
Boston	Allen	E. A. Gilmore
Boston	Millburn	E. Y. Simpson
Boston	Paterson	R. W. Vining
Boston	Pathfinder	W. Hillard
Boston	Empire	Leo Spigelmeier
Boston	Apperson	Brown-Apperson Co.
Boston	Premier	Eads-Loud Co.
Boston	Simplex	G. W. Canterbury, Inc.
Boston	Stewart	H. Ross Maddocks
Boston	Regal	C. P. Robinson Co.
Boston	Ohio	D. C. Tiffany Co.
Campello	Detroit	Franklin Motor Co.
Fall River	Oldsmobile	Pocasset G. & M. Co.
Fall River	Maxwell	T. Paquin
North Adams	Saxon	A. S. Williams
Springfield	Hudson	Harrington-Gifford Co.
Woburn	Overland	J. H. Bates & Son
Worcester	White	White Motor Co.
Worcester	Detroit	Louis Bellinger

Feb. 16-18, Bloomington, Ill.—Show, Deere building.

Feb. 18-20, Racine, Wis.—Racine Auto Show Association show, Lakeside Auditorium.

Feb. 22-25, Allentown, Pa.—Show.

Feb. 22-27, Duluth, Minn.—Show.

Feb. 22-27, New Haven, Conn.—Automobile show, Second Regiment Armory. W. N. Lindsay, manager.

Feb. 22-27, South Bethlehem, Pa.—Automobile show; Coliseum; J. L. Elliott, manager.

Feb. 23-27, Ft. Dodge, Ia.—Automobile show, Armory.

Feb. 23-27, Syracuse, N. Y.—Automobile show, State Armory, Syracuse Automobile Dealers' Association.

Feb. 24-27, Indianapolis, Ind.—Fort Wayne Auto Trade Association show.

Feb. 24-27, Battle Creek, Mich.—Show, Rathburn & Kraft building; Messrs. Riley and Wattles.

Mar. 1-5, Wilkes-Barre, Pa.—Vehicle Trades Association show.

Mar. 1 to 5, Sioux Falls, So. Dak.—Automobile show, Auditorium.

Mar. 1-6, Utica, N. Y.—Automobile show; Automobile Club of Utica.

Mar. 2-9, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association show; 23rd Regiment Armory.

Mar. 4-6, Springfield, Mass.—Show, J. H. Graham, manager.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

Mar. 8-13, Indianapolis, Ind.—Annual Spring Opening, Indianapolis Auto Trade Association.

Mar. 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

Mar. 8-13, Canton, O.—Stark County Automobile Show and Electrical Exposition show, Auditorium.

Mar. 8-13, Utica, N. Y.—Utica Automobile Trade Association show.

March 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers Association. J. Clyde Myton, manager.

Mar. 22-27, Bangor, Wis.—Automobile show, Auditorium; A. P. Pierce, manager.

MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 8

New York, February 24, 1915

Ten cents a copy
Two dollars a year

PIERCE-ARROW

The mind of the owner of a Pierce-Arrow does not run on ahead of him in vain speculation as to whether the car will be on time, or will get him there on time. He soon sinks into a feeling of trustfulness in regard to his Pierce-Arrow. He need never interrupt his plans, break an engagement, allow greater time for going to and fro, or omit doing anything that counts upon the faithful efficiency of a Pierce-Arrow.

THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO NEW YORK



R. C.

While You're Overhauling My Car Install

DANN INSERT

"The Inter-leaf Shock Absorber"

Thousands of cars are going into shops in the next month, for their annual overhauling.

And in the majority of cases, special attention will be demanded for the springs.

Every car that comes into your shop, means a live prospect for DANN INSERT—the only satisfactory device for effective and continuous lubrication of spring leaves.

There Are Three Profits On Every DANN INSERT Sale

There is your profit for the sale—a liberal dealers' discount. There is your profit on the work of installation. And there is a tremendous profit from the "good will" aroused by DANN INSERT.

DANN INSERT is the accessory that works both ways—for your customer, and for you.

Order your supply now, to fill the demand we are creating. Write for liberal discounts.

Dann Oil Cushion Springs

Highest quality springs, equipped with DANN INSERT are our newest product. A necessity in your stock. Write for dealers' discounts.

Dann Oil Cushion Spring Insert Company

2265 Indiana Avenue

Chicago, Ill.

Then I'll take
off the shock
absorbers
You won't need
them



The Insert of 10000 Oil Rockets



The Automatic Switch is the Principal Reason Why Connecticut Automatic Ignition is not *ordinary*.

The car you buy should be equipped with a High Tension Magneto

There are two kinds of ignition—the ordinary battery system and the high tension magneto system.

The battery system is the cheapest.

It is not always reliable though many popular priced car manufacturers still furnish it.

The high tension magneto system is the most expensive.

It is the *most* certain.

It is the *most* uniform.

Practically all the highest priced cars are equipped with the high tension magneto system.

IF, as one car manufacturer claims, a high tension magneto gives better results than ordinary battery ignition, CONNECTICUT AUTOMATIC IGNITION is superior to any—battery, magneto or a combination of both—because—as the result of the thorough saturation of its coil, made possible by its Automatic Switch, it delivers an effective spark at all speeds—a spark at the highest attainable speeds, equal to, if not better than the magneto's best effort.

AUTOMATIC · IGNITION CONNECTICUT

In reality CONNECTICUT AUTOMATIC IGNITION is a magneto mechanism less its current generating unit, but due principally to its Automatic Switch its spark grows hotter as motor speed decreases—just the reverse of the magneto's action.

Thus the effectiveness of CONNECTICUT AUTOMATIC IGNITION is tempered to meet the requirements of the motor.

Utilizing the current from a storage battery charged by the dynamo of the car's starting and lighting equipment it has a more uniform source of current supply than the magneto.

CONNECTICUT AUTOMATIC IGNITION is less expensive than the magneto because it needs no dynamo of its own.

While magneto ignition is good ignition at high speeds, CONNECTICUT AUTOMATIC IGNITION is equally good at high speeds and infinitely better at all other speeds.

CONNECTICUT TELEPHONE and ELECTRIC COMPANY, Inc.
Meriden Conn.

STIMULATE YOUR SPARK PLUG PROFITS

Concentrate your sales effort on quality plugs—Plugs that give your Customers service and pay you better profits.

This new Display Case will do it.

It provides a counter or window display that attracts—

Contains a complete stock—

Saves space, keeps the stock clean—insures a quick turnover, and yields 100%!

It is

A Display	For	
A Stock		\$25.00
A Salesman		

BETHLEHEM FIVE POINT SPARK PLUG

Guaranteed for the Life of the Car

There is a Bethlehem for every motor.

In the Display Case are instructions as to the right plug to sell for each car.

SERVICE brings profits—that is what Bethlehem's give the customer—it is what The Silvex Company gives you. Write us.



THE SILVEX COMPANY, 171 Madison Ave., New York

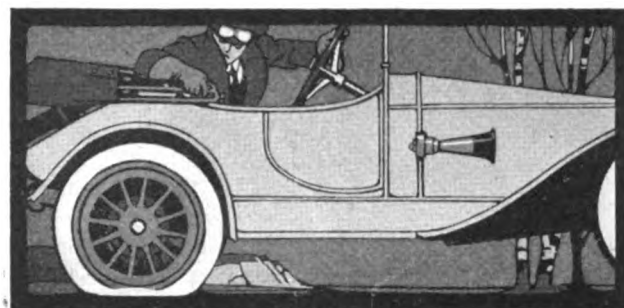
Factory: South Bethlehem,
Pennsylvania.

Pacific Coast Branch: Oakland, California.

W. N. DAVIDSON, Manager

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Gone Flat Again!

No sharp report. Just the gradually perceptible jolting that tells of a leaky tube gone flat again. Hot, shadeless road and a dusty, dirty job.

That's the story of the needless puncture so common with cheap, machine-made tubes that leak around valves and become porous in service.

The way to avoid these unnecessary punctures is to equip your car with Kelly-Springfield Tubes, which are made *slowly and painstakingly by hand and out of real rubber.*

Kelly-Springfield Tires are made the same way. Use them with Kelly-Springfield Tubes and you will add increased tire mileage to freedom from needless tube trouble.

Send for "Documents in Evidence" which tells the experience of others

Kelly-Springfield Tire Company

Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.
The Southern Tire & Repair Co., Houston and Beaumont, Texas
Boger-Stiess Rubber Co., 1208 Hennepin Ave., Minneapolis, Minn.
The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.
The Olmsted Co., Inc., Syracuse, N. Y.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.

L. J. Barth, Rochester, N. Y.
Seifert & Baine, Newark, N. J.
Atkinson Tire & Supply Co., Jacksonville, Fla.
Central Rubber & Supply Co., Indianapolis, Ind.
C. D. Franke & Co., Charleston, S. C.
K. & S. Auto Tire Co., Limited, Toronto, Ont.
Todd Rubber Co., New Haven, Conn.
Barnard-Michael Tire Co., Buffalo, N. Y.





300 Cars A Day

On February 15th we delivered 300 Overlands valued at \$296,725.

This is the first day following the two biggest weeks in our history.

And this is merely an incident of what is going to be the greatest year in the history of our great business.

Watch this space for other important information.

Handsome catalogue on request. Please address Dept. 50.

"Made in U. S. A."

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, February 24, 1915

No. 8

Hotel-Garage-Restaurant in Single Building

All-in-one Establishment Cares for Man and Car in Small Pennsylvania Town—Proprietor Plans a Chain

WHAT is probably the most original and unusual garage in the world is operated by Lee F. Hoffman in Bedford, Pa. It

is a garage, hotel, restaurant, barber-shop and novelty store with waiting rooms, telephone booths and all that a motorist might require in his touring. The town is 96.9 miles east of Pittsburgh and 197.9 miles west of Philadelphia, and has a population of only 2,235, but 210 miles of the roads on all sides of Bedford are covered with Hoffman signs of all sizes, and no tourist gets through that section without at least being made aware there is such a garage.

Plans New \$100,000 Building

So successful has the venture been that Hoffman is forming a stock company and by next summer will have a new building in service; without equipment it will cost \$100,000 and is expected to make a big increase in the business. Further plans include a chain of Lincoln Way garages.

Hoffman's success is directly attributable to his advertising and his ability to grasp every idea that comes along and make it work for him; if no idea presents itself he hatches one and harnesses it. His ideal is to **SELL EVERYTHING THE TOURIST NEEDS.**

Also, he has learned the value of concentration; he entered the trade in 1904 in Meyersdale, Pa., his home town, and has had garages in half a dozen towns. At one time he had three garages in as many towns at the same time, but he found it was hard to divide his attention



The most usual entrance to Hoffman's most unusual garage and hotel in Bedford, Pa.

to this extent; the three did not show a proper profit, so he concentrated on the Bedford garage in 1911 and has built it up. The hotel and restaurant part was erected last spring. He now owns the building and the real estate on which it stands.

His layout of advertising literature and signs is comprehensive, yet it is not expensive; for literature and printing the annual item is about \$200 and for signs

about \$500, including placing. A McCaskey system is used with a large daily and monthly sheet which shows where the business stands. Hoffman states that next year he may require a more elaborate system, but that for an establishment operated by one man the present method is sufficient.

Things He Has Done

To go into a story of all his activities would make a volume. Here are some of the things he has done and does:

Built a roadside mirror at a dangerous curve, permitting tourists to "see around the corner." He keeps it clean, too.

Hands out warnings of speed traps and speed limits, distributed by boys with red flags.

Has placed Lincoln Way signs for 150 miles; he is a consul for the Lincoln Highway Association and has an "official" car which is no small advertisement.

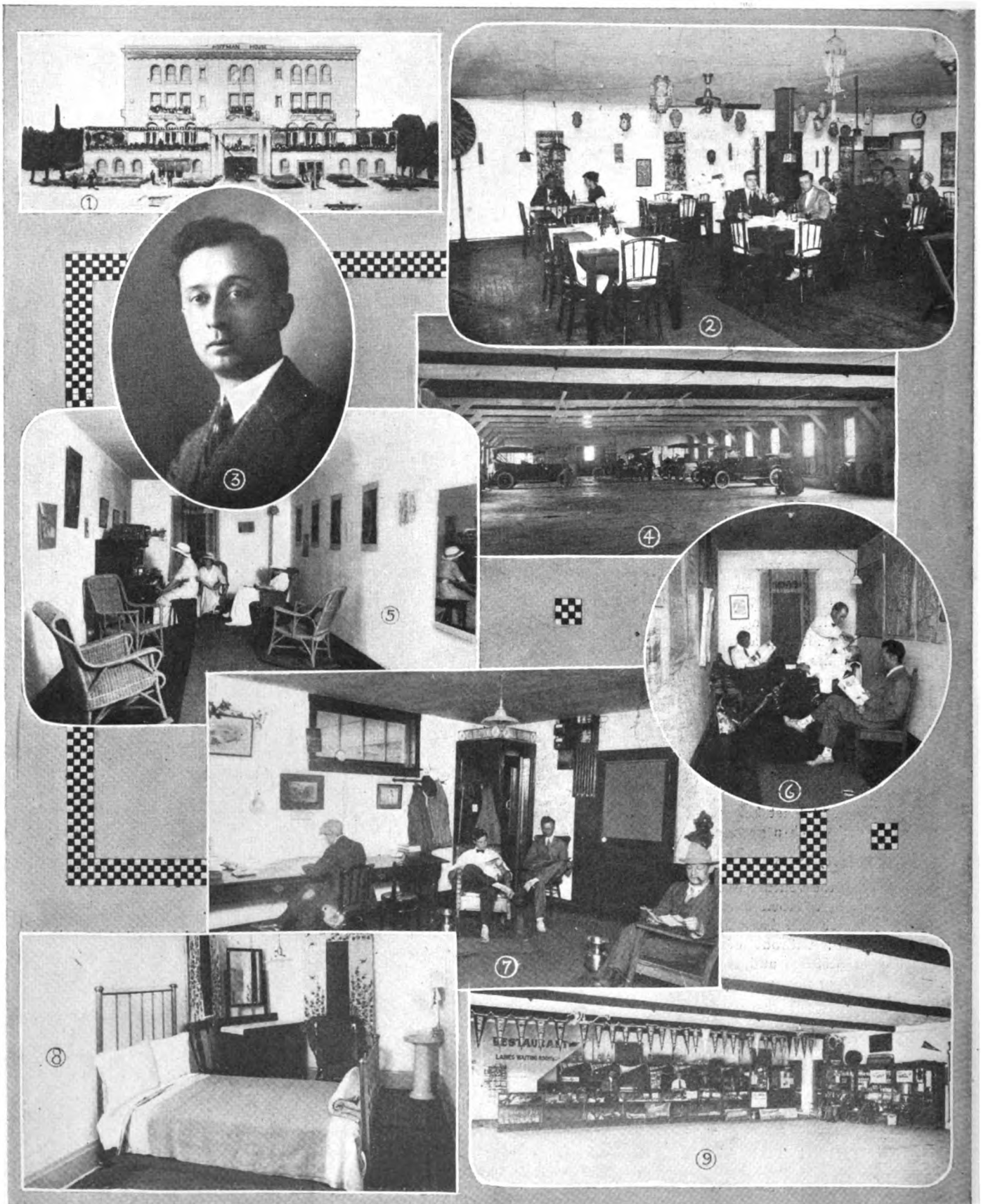
Hands route cards and road maps to tourists.

Originated and sells pennants, "Excuse our dust" and "We should worry."

Advertises extensively with handbills; has men stationed outside Bedford, handing various bills and menu cards to incoming tourists. Nearer the garage he has boys who supplement this with smaller bills, thus not letting the prospective customer go astray.

Distributes route cards, showing road with mileages from Bedford to Pittsburgh and to Philadelphia. These cost about \$5 a thousand.

Views of Hoffman's Combined Hotel and Garage



1—The \$100,000 garage and hotel, to be erected. 2—The restaurant. 3—Lee F. Hoffman, the proprietor and the originator of the project. 4—The garage floor is kept clean.

5—The room designed for the comfort of women tourists. 6—The barber shop and the ubiquitous magazines. 7—Lounging and writing room, with long-distance telephone booth.

8—A sample of the rooms in the present building. 9—The store, where novelties and necessities are sold. Hoffman, in gray suit and white shoes, appears in pictures 2, 6 and 7.

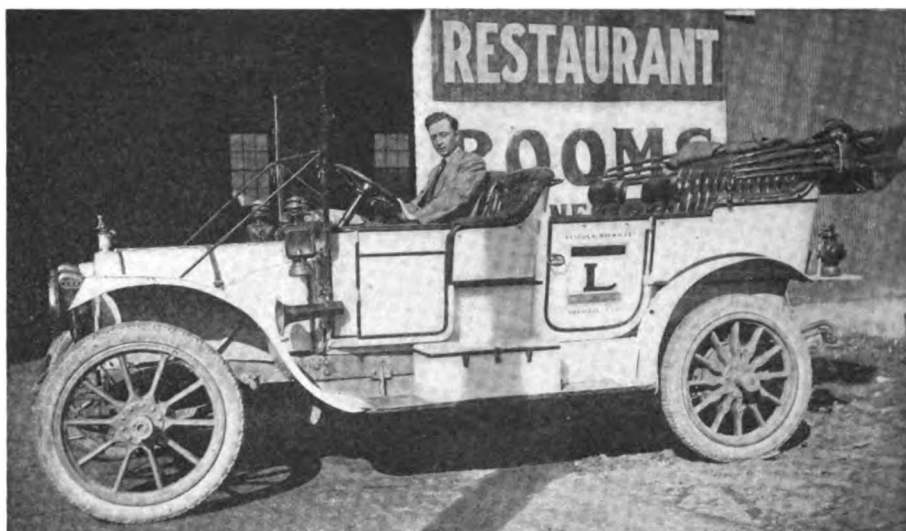
And besides these there are many things which Hoffman does, many of them being advantageous moves for some particular occasion. One day Thomas A. Edison and his wife stopped at the garage and commented on it in the Bedford Inquirer and the Pittsburgh Gazette-Times. Hoffman promptly reproduced the stories and incorporated them in his advertising literature.

In road signs a variety of size and style is regarded as efficacious. They range from 6 x 12 to 10 x 20 feet; these were made in the shop by the employees during their spare time and were painted by a New York painter who was taken to Bedford and kept busy several weeks, painting these signs and the ends of barns with Hoffman messages. Little newspaper advertising is used, as the garage caters to transient trade and local newspapers are therefore not considered the best mediums to use under the circumstances.

Both Original and Successful

The building which it is expected to erect will, of course, make the garage-hotel a more pretentious place to stop. The present building contains ten furnished rooms and the restaurant will seat 40 people at one time. During the touring months the staff consists of four shop men, four garage floor men, who attend to tourists and sell supplies, a cashier, a stenographer, a bookkeeper, three waiters, a chef, an assistant chef, a chamber maid, two bill boys and an outside man. The bill boys are stationed several miles outside the town and distribute handbills calling attention to the garage and its accommodations. The outside man stands at one of the principal corners in town and directs cars to the garage.

The departments of the business are: Restaurant, rooms, store, parts and supplies, tires, repair-shop, vulcanizing shop, gasoline and oil and storage, wash and polish. The store sells pennants, candy, cigars, cigarettes, tobacco, postal cards, novelties and the many little things the motorist likes to find at hand in the course of a tour. The store stock will



Hoffman has styled an old Packard his "official Lincoln Way car" and it brings him considerable publicity. Hoffman is at the wheel

be much more complete in the new building than it was in the old.

Original as it is, the venture has been a success; last summer the biggest day's business was 214 cars, which, from, say 8 A. M. to 10 P. M., is 15 cars an hour, or one every four minutes. To make it

SAMPLES OF TWO DEPARTMENTS' BUSINESS

1914	Restaurant	Rooms
June	\$222.40	\$135.55
July	432.01	215.45
August	526.65	294.75
September	449.22	241.75
October	340.17	198.00

a success, of course, the proprietor of such an establishment must be sufficiently versatile to play the part of hotel proprietor and must also be able to conduct the whole on a business basis, keeping accurate track of the receipts and expenses.

Hoffman has also made the place comfortable, which is in decided contrast with many of the hotels the tourist strikes. A glance at the illustrations of

his place reveals an effective story. And what is perhaps not always found but which always wins favorable attention is the cleanliness of the garage floor.

The new hotel will have nearly 100 rooms, a good proportion of them being equipped with baths. In the new building, which is No. 1 on page 6 of this story, the entrance through the center is an arcade which extends straight through to the rear. This ground floor contains the desk, lobby, billiard room, barber shop, chauffeurs' dining room, kitchen, laundry and the many other essentials generally found on the street floor of a hotel; in addition there is at the rear the garage and shop. The store and lounging rooms are also on this floor.

Reasonable Charges Are Made

The next floor will contain the restaurant and a foyer, also several private dining rooms; the remainder of the floor is devoted to rooms. The two top floors are of regular hotel room construction and layout. Special Sunday meals are generally 75 cents, with regular service a la carte.

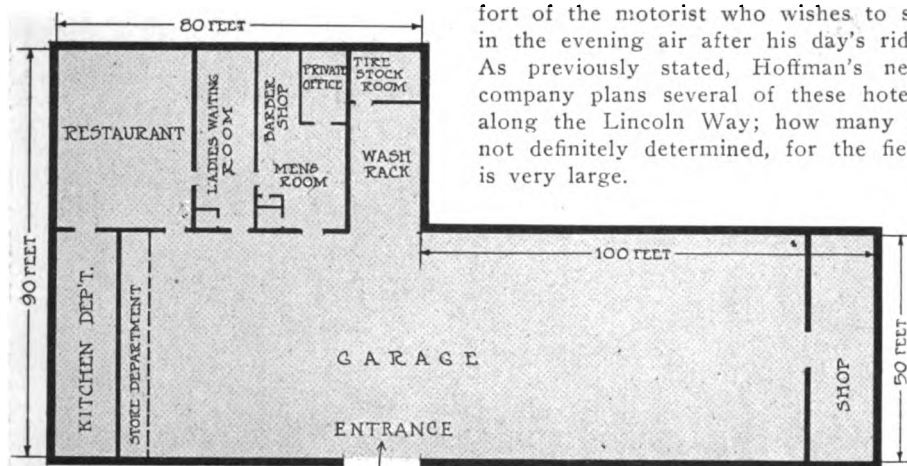
And the charges are reasonable. A sirloin steak is 30 cents, ham and eggs



On a dangerous turn Hoffman has placed a mirror which enables the tourists to see around the corner



This is typical of the way he has covered his section of Pennsylvania with signs. This one is visible a quarter of a mile



This is the floor plan of the building Hoffman is occupying at the present time

30 cents, desserts generally 10 cents, soups 10 cents, most vegetables 10 cents, most sandwiches 10 cents, tea, coffee, etc., 5 and 10 cents. The restaurant also dispenses spring water at reasonable figures.

A feature of the construction is a sound-proof barrier between the street floor and the upper floors; this prevents noise of cars ascending from the garage and shop to the rooms. The pergola at the front is designed for the com-

fort of the motorist who wishes to sit in the evening air after his day's ride. As previously stated, Hoffman's new company plans several of these hotels along the Lincoln Way; how many is not definitely determined, for the field is very large.

Under the system of management and advertising the tourist who comes within the zone of the Hoffman Garage is well taken care of. He is warned of speed traps, directed by road signs, guided by Hoffman's outside men, fed, sheltered and cared for over night, and in the morning sent on his way with a route card which will carry him west to Pittsburgh or east to Philadelphia. And he is always given a hearty invitation to come again.

Jitneys Prosper in Kansas City

**Nickel Fare Draws 45,000 Passengers a Day—
Cars Cost \$7 to \$12 a Day to Operate
and Bring in \$20 to \$30**

KANSAS CITY is rapidly being jitneyized. After three weeks, more than 222 jitneys were registered, this not including fifty or sixty that have already found the nickel pace too trying and have withdrawn. In one day last week 45,000 people were carried on jitneys; today that figure has been passed, and by the middle of next week conservatives say 50,000 a day will be carried in the four-, five-, six- and seven-passenger motor cars and the eighteen- or thirty-passenger buses that carry the jitney sign on the windshield and on each side.

Stand at the headquarters of the Jitney Transportation Co., 1133 Grand avenue, near the heart of the city, for five minutes. Each minute from six to ten jitneys roll up to the curb, each loaded with five to seven passengers. The approach of each is heralded by the megaphone man, who calls out the route and the destination. Each pauses for a few seconds, two or three get out, others take their place, and the jitney is off on rail-

road schedule. Minute after minute and hour after hour this caravan comes and goes, starting at 6:30 in the morning and stopping at 7:30 in the evening. After that hour all service is by special arrangement.

And these jitneys are just touring cars. Cars with a sign on the windshield, "Grand Ave. & 12th to Prospect & 27th," or of other streets. There is a big "S" somewhere on the windshield and perhaps others on the doors. Within a week the Jitney association hopes to have a standard street sign that will be illuminated at night and which can be readily attached to any car. In addition to the designation of the route it will contain a large "S" and a serial number as registered by the Jitney association, in order to facilitate checking at different depots.

Anyone with a car can become a jitney operator. A dollar a week is needed. You pay that to the Jitney association in order to get the privilege of being announced at the various dispatching de-

pots and to get reduced rates on gasoline, oil, tires and other supplies. A little later a big garage will be conducted and every registered jitney will get repairs slightly above cost.

Once registered, each car is put on a schedule. Some routes have 2-minute service both ways, others 2½ and others 5 or 10 minutes, according to the demands. This schedule is maintained, and one car rarely passes another.

Profit in Jitney Fares

How can they make money by carrying a passenger for a nickel—a jitney—is the question heard on every corner. The proof of the pudding is in the eating. A five-passenger car working on a route 2 or 2½ miles from end to end is making \$7 to \$12 per day. These cars make the circuit in 20 to 30 minutes and are generally on streets with trolley lines. With the jitney the passenger can save 10 to 15 minutes on the trolley trip. That is why they are so popular.

The Jitney company claims that it costs approximately \$2.50 per day to run a Ford five-passenger car. It costs very little more for Overlands, Buicks, Studebakers, Hups, Maxwells, etc. Today one-half the jitneys in Kansas City are Fords, but in addition to other makes mentioned there are several seven-passenger cars, including Packard, Peerless, Oldsmobile, Stoddard-Dayton, Imperial, etc.

Five-passenger cars are possible in jitney service where the ride one way does not exceed 2½ miles. This is the maximum. The minimum is slightly under 2 miles.

Buses Best for Long Routes

When the distance is more than 2½ miles and up to 4 miles the seven-passenger car giving an express service beyond the 2½-mile limit is possible. Over 4 miles the jitney bus offers the only possible conveyance. Some of these buses carry twelve passengers and others twenty. They are single-deckers, enclosed and with glass windows all around. There is generally one side entrance on the right, immediately back of the driver, who sits on a revolving seat, so that when he stops he swings partly around, opening the door and collecting the jitney as the passenger enters. When driving, the seat obstructs the door, preventing passengers leaving. Some of these buses are averaging between \$20 and \$30 per day.

New buses are being registered every day, many of them preferring the 2½- to 4-mile zone. These buses are generally built on old touring car chassis. A typical example is that of using an Oldsmobile chassis and adding a bus body seating fourteen and costing \$200. When a bus has to go beyond the 6-mile zone the single-decker does not pay, but double-deckers will have to be introduced. None has been started yet.

Psychology Is Applicable to Salesmanship

Assistant Sales Manager Corbin Seeks to Develop Automatic Type of Salesmanship

AN automatic type of salesmanship wherein the presentation of the right selling argument at the right time will be as automatic with the salesman as is the lifting of his foot when he approaches a curbstone is part of the plan of the Packard Motor Car Co. as outlined by Assistant Sales Manager Arthur E. Corbin before the Executives' Club of Chicago at a show week meeting.

By this it is not intended that any man shall sell by book, but it is planned that by training of men and the reduction of the sales arguments to a standardized basis the arguments shall become a habit with the man, leaving his mind free to the working out of other details of the sale in progress. He may find it necessary to make out a contract or figure on unusual features, and the plan outlined aims to make his efforts on these unexpected lines more efficient by relieving him of the necessity of keeping close mental watch on his sales contentions. Corbin compared this ideal of standardization to the automatic lifting of the hand when the wind starts to lift one's hat from his head.

Selling is Like Military Practice

He emphasized the value of psychology in selling and pointed out that most can be accomplished through a study of and adherence to the underlying laws of this science, which he termed "the science of the soul."

"The power of psychology and its influence on business I cannot impress upon you too strongly. A certain big corporation has put everywhere before its men the word 'Think.' If we think we reason; if we reason we reach conclusions; if we make conclusions we plan and if we plan we are self-teaching. We hope to develop our men so they will be self-teaching."

At the outset Corbin stated his topic was Planning Ahead, and in this connection he said the executive and sales manager could not study military science too closely in his aim to plan ahead. "Military science," he said, "has been built up through centuries. It is one of the oldest. You even speak of your selling work in military terms: you have a staff, a firing line; your goods are your ammunition; the privates are the salesmen; your commissary department is your service department; you have sharpshooters and all the other units in



Arthur E. Corbin, Assistant Sales Manager, the Packard Motor Car Co.

"Planning ahead is fundamental to success."

"Only profitable time is that spent with prospects."

"If we think we reason, and we reach conclusions."

"Develop salesmen so they will be self-teaching."

"Motor car industry grew up around the garageman."

"It is now time to improve the men in the industry."

military practice, and strategy is planning ahead. And if you have more men than the enemy at the point of contact you can win.

"The motor car industry has grown up about the garageman and has come through the Forty-niner rush of disorganization. Heretofore great attention has been paid to the development of machinery and great improvements have been made; it is now time to improve the men in the industry, and this will be done through psychology.

Try To Give Salesmen Knowledge

"There are certain requirements for the successful salesman. If he comes to us with health, honesty, personality and good appearance we try to give him knowledge and experience. We try to teach that the only profitable time is that spent in talking to the prospect and that the salesman should keep replen-

Military Science Should Be Studied as Basis for Systematic Planning of Selling

ishing his prospect list. We also teach men to avoid crossing their tracks. If a map of his territory is in the form of a cross with 25 per cent in one arm, 15 in another, 5 in another, 5 in another, and 50 per cent in the center, he should divide his time under normal conditions in this proportion to these territories. He should not spend 50 per cent of his time in a 5 per cent territory.

"One of the most important features of organization is the relation of the balanced executive to his employees. Loyalty is the first requirement of a Packard executive, and he must lead, rather than drive.

"You can't drive a man into getting orders. Tell him to go out and get the order for the honor of the company, for his own advancement and for the family and kiddies at home. Also, we have found that salesmen care more for the honor of winning a contest than they do for the prize, so we make the remuneration secondary but nevertheless substantial.

Office Boy Reflects the Boss

"The other important relation of the executive is to his patrons. The office boy always reflects yourself. You can't get away from it. I have often made mental calculations as to the boss by studying the office boy while I waited. The executive must have the confidence of his patrons, and once gained he cannot take it from you; it is not his to take. He may go somewhere else, but if you have his confidence he will come back. Gentlemen, that's a law.

"When the European war broke out it affected finance at once and we received 100 cancellations of orders, all of which we accepted. We also asked our dealers to pay to the salesmen the commissions on these cancelled orders, for the men had earned them. And since then over 85 per cent of these cancelled contracts have been renewed and the majority of the cars delivered.

"In the development of a business, Planning Ahead is the fundamental rock on which successful corporations have succeeded." At the conclusion of Corbin's address one of the members of the club asked why he should buy a Packard when he could get a good car for less money; if Corbin's immediate attack is followed up this questioner stands an excellent chance of being a Packard owner at no distant date.

WIDE-AWAKE MERCHANDISING

ACT NOW! AND WHERE YOU ARE!

You Don't Have to Wait Until You Have a Better
Salesroom Before You Trim the Window—
Grasp Ideas and Make Them Work

"If I only had a new suit of clothes and a nice place to live," says the habitual drinker, apologizing for his condition, "then I would stop this habit. But what's a fellow going to do when he has no clothes and no place to go."

Do you see any resemblance in that line of talk to the statement made by some dealers who apologize for the obvious faults and shortcomings of their establishments? "We can't use that idea for window displays—it's no use our trying to do anything in these quarters. Wait till we get into a new store. Then we'll show 'em what we can do." Or perhaps you've heard one of the other ones. It goes like this: "If we only had a decent salesroom we could use a lot of those up-to-date ideas. But, in this place? Never! No use trying."

There are a great many more such excuses. They are offered by dealers themselves to customers, sometimes to themselves. And they are no more reasons for not doing up-to-date things and employing modern, aggressive ideas than the drunkard's excuse. The way to be up-to-date is to be modern in your ideas and your methods. It doesn't do any good to have the ideas unless you translate them into action.

Don't wait any longer! When you read or hear of any good idea seize it and make it your own instantly. Don't worry over the fact that you did not think of it first. Add it to your capital and resources by employing it. Get the habit of reading the experiences of others into your own business. You will find that the occasional good idea that you secure will more than repay you—PROVIDED YOU PUT IT INTO ACTION.

And right in that simple little word "action" lies the whole secret. For unless you act in accordance with them all the inspirations in the world will do you little good. Resolve now to be a doer—not a hearer only.

DOG MAKES SUCCESSFUL BID FOR FAME IN WORLD OF ADS

One of the original and novel mediums in the field of advertising is Prince, who just now is connected with the Thermoid Rubber Co. He boosts Nassau tires.



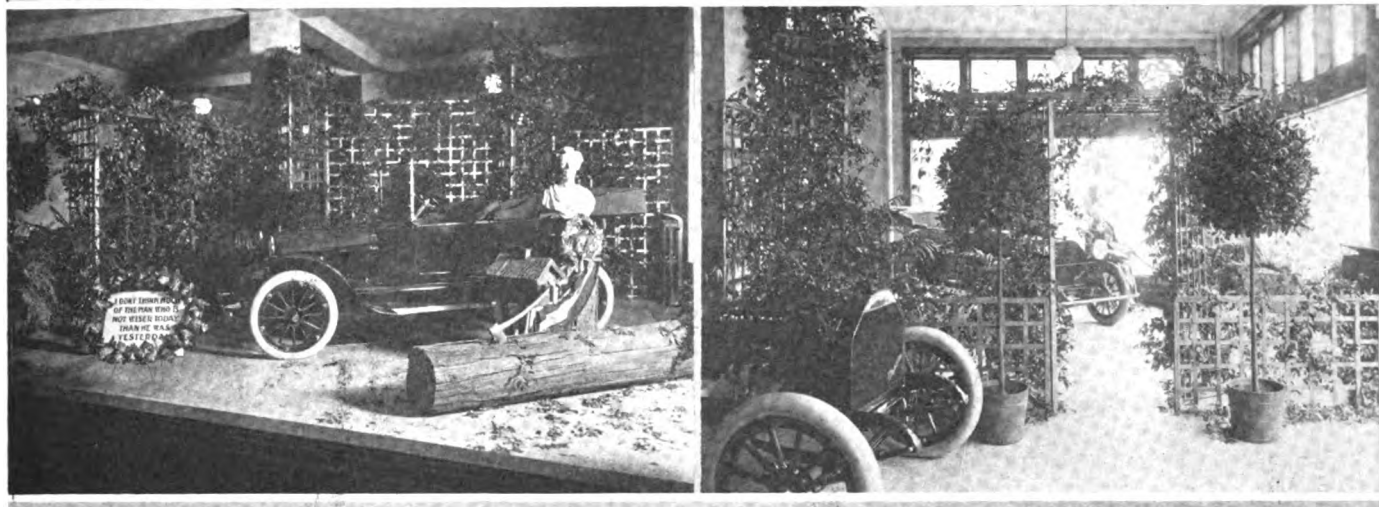
Prince, a well-known canine advertiser

He is always accompanied by an attache of the Coliseum, Chicago, who is known to hundreds as Whitey; during the recent show in Chicago Prince and Whitey spent their time in the alley between the Coliseum and the Armory. They travel wherever there are crowds. Prince is very fond of his umbrella, and at night carries a lantern on his back.

Few Properties Make a Pretty Window



This display is simple and good—boulder at sharp turn in road, tire leaving non-skid trail in sand road, snow-covered hill with electric Firestone sign on hill, old fence, forest made of pine bushes, toy cars on road. Cotton wool makes the snow. It is the window of the Firestone branch in Washington, D. C., and was put together by K. J. Hines



The salesroom of the Detroit Studebaker branch drew attention through its Lincoln birthday decorations. The rail splitter display was temporarily partitioned off from the remainder of the floor

MAKE WINDOW FOR HOLIDAY

Studebaker Detroit Branch Won Attention Through Lincoln Birthday Display

It is pleasant to note the growth in striking window displays made by motor car dealers the country over. There is a big advance over a year ago; dealers of the live sort no longer hesitate about dressing up their windows, and in most of the large cities opportunities for attractive and unusual displays are being eagerly grasped.

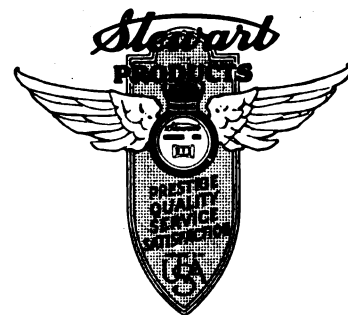
The photographs show an unusually effective display by the Detroit branch of the Studebaker Corp., made during the week of Lincoln's birthday. Not many dealers saw this opening to associate recollections of "Honest Abe" Lincoln with their car, but somebody at this branch both saw and utilized the occasion. And the constant crowds in front of the Studebaker store proved that the public fully appreciated the exhibit.

The window is in a corner of the salesroom and was temporarily partitioned off from the rest of the sales floor by means of lattice work rented from a local florist and decorated with southern smilax. Note the splendid white marble bust of Lincoln mounted on a log pedestal. And the artistic use of flag and wreath. Then observe the neat little log house and the big log into which is sunk the axe of the "rail splitter." At one side, encircled by a wreath, is one of the homely sayings of the martyr President, "I don't think much of the man who is not wiser today than he was yesterday."

Inevitably the person looking at this display cannot help but associate some of the rugged honesty of Abraham Lincoln with the product so displayed. There was no obvious attempt to link up Lincoln with the Studebaker corporation's product; nevertheless the association of ideas is present.

How does the Studebaker corporation cash in on this display? someone asks. That is a fair question, and the answer is important, for the dealer who expects a cash return immediately from all his efforts in the way of displays is bound to be greatly disappointed. But the dealer gets the point quickly when he realizes that just as personal character is the sum of all our acts, so the reputation of a business concern, its character, if you please, is the sum of all its activities. The public forms its impression of you by what you do and how you do it. If you are up-to-date, aggressive, live, wideawake in your methods the public will sense it instantly.

And it gets its notions from just such occasions as this. You cannot tell how many prospects you are impressing, but you do know that you can do nothing in

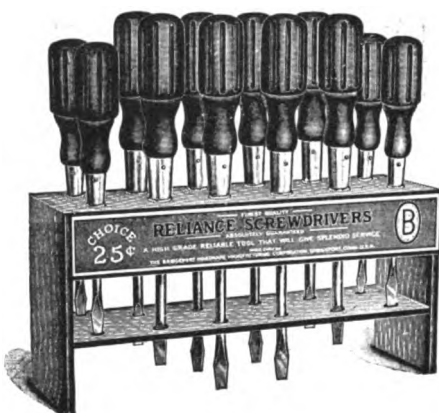


The Stewart-Warner Speedometer Corporation has adopted this new trade-mark with the U. S. A. symbol

display work so broad and patriotic as this without heightening public confidence and friendliness of feeling. It is impossible to say how or when you will cash in on it—but you will.

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. One is illustrated herewith and this will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



Both handy and attractive is this display stand which is furnished to dealers with an assortment of screwdrivers by the Bridgeport Hardware Mfg. Corporation, Bridgeport, Conn. It contains a dozen. The rack is furnished only with assortment No. 35, which consists of 4 4-inch, 4 5-inch and 4 6-inch screwdrivers. Placed in a supply department or store, this rack not only enables the buyer to see the goods but furnishes him with a comparison which helps him choose the size he wants.

Dealers Who Were Responsible for Kalamazoo Show



These members of the Kalamazoo Dealers' Association are, left to right: Gene Avery (Cadillac); Tom Orrell (Chalmers); E. L. Stevens (Buick); Mr. Nash (Reo); Harry Parker (Overland); L. Flansburg (Overland); E. E. Coombs (Saxon); Ralph Beebe (Service Shop); W. O. Harlow (Ford and King); F. Milliman (Reo); J. M. Van Loon (Cadillac)

Champion Spark Plug Men Who Convened at Factory



1—Geo. L. French, Jr.
2—Chas Corwin
3—J. F. Barr

4—F. D. Stranahan
5—H. A. Kaiser
6—H. W. Biddle

7—R. A. Stranahan
8—H. L. Corey
9—C. F. Draper
10—F. B. Caswell

10—W. B. Canis
11—H. E. Butcher
12—R. C. Parrish

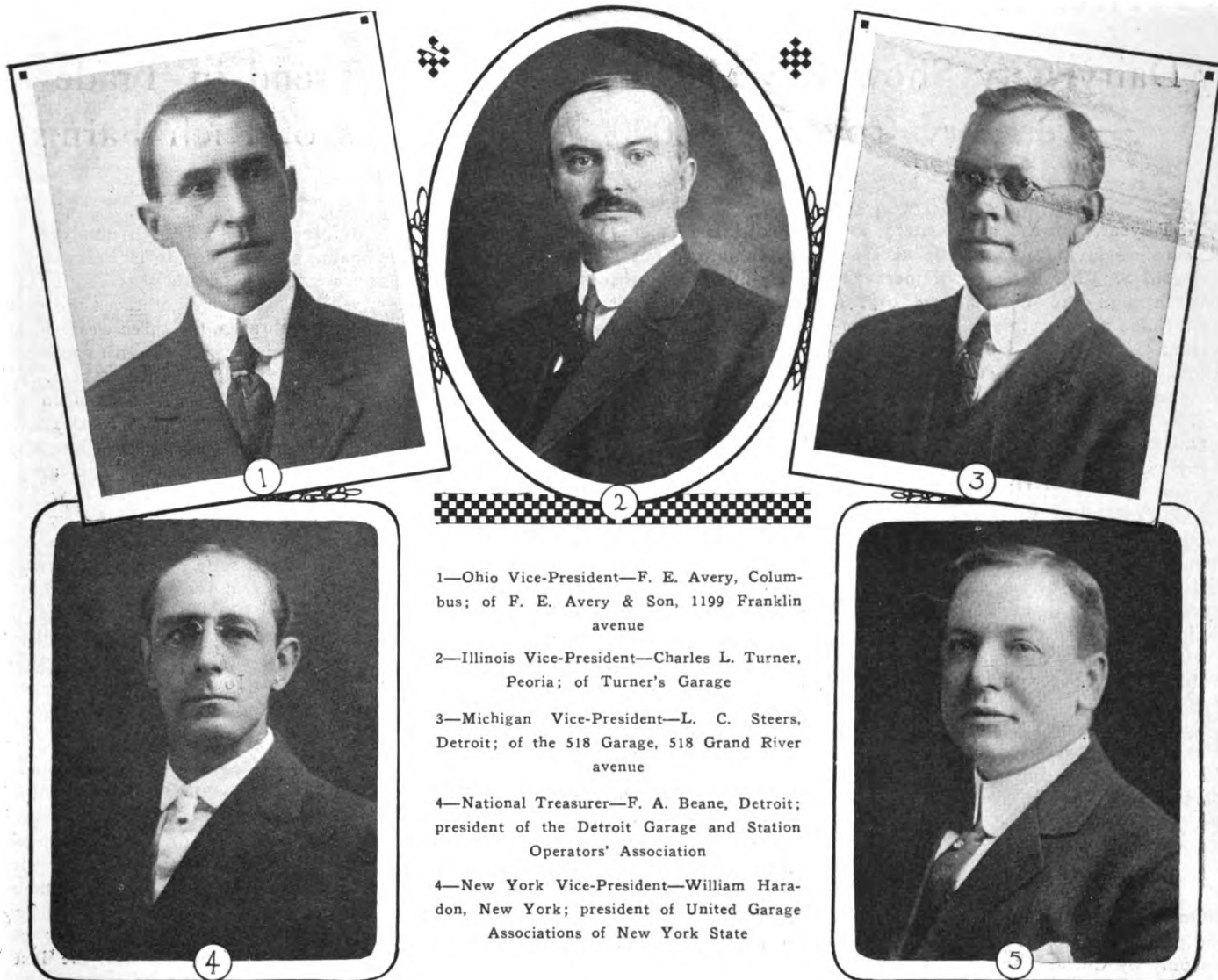
13—E. S. Torrance
14—J. T. Moulthrop
15—C. B. Clark

The salesmen of the Champion Spark Plug Co. met at the factory in Toledo, O., January 19, 20 and 21, for their annual convention. An interesting program was carried out.

Tuesday and Wednesday, the first two days of the session, were devoted to discussions of business problems and questions which have appeared in the work of the men in the field.

Thursday, the last day of the convention, the company took the salesmen to Detroit. Here they inspected several of the large motor car factories and also visited the Detroit automobile show.

State Vice-presidents of the Associated Garages of America



1—Ohio Vice-President—F. E. Avery, Columbus; of F. E. Avery & Son, 1199 Franklin avenue

2—Illinois Vice-President—Charles L. Turner, Peoria; of Turner's Garage

3—Michigan Vice-President—L. C. Steers, Detroit; of the 518 Garage, 518 Grand River avenue

4—National Treasurer—F. A. Beane, Detroit; president of the Detroit Garage and Station Operators' Association

4—New York Vice-President—William Haradon, New York; president of United Garage Associations of New York State

Northern Illinois Welcomes the Sun of Springtime

Snow and Hoof and Mouth Disease Have Retarded Rural Business

Coupled with an unusually hard winter, the hoof and mouth disease, which affects herds of cattle and other cloven-hoofed animals, has given business in Northern Illinois and other western localities a slight setback. It is not regarded as permanent, however, and dealers are looking forward to a good spring business. The hoof and mouth disease has made its appearance spasmodically in many sections of the West, but not all have had the hard winter which has hit the region about the Great Lakes.

The snow has been deep, making country roads impassable to a motor car, and little rural business, which is a large percentage of the total, is anticipated until the snow goes. One farmer near Freeport, Ill., who wished his car overhauled blocked it up on a pair of bobs and drew it into town; but with the snow roads full of pitch-holes it was a risky

job, and while repairmen have had a slack trade in some towns because cars could not be brought in, they are not willing to assume the risks of such transportation of a car.

When a county is under hoof and mouth quarantine cattle cannot be driven across the road, grain cannot be carried over the roads, affected herds are often all killed and the farmer's income is sadly affected. Inspectors killed 120 cows and a large herd of swine on one farm where the disease had hit.

The disease first affects the cloven hoof, which the animal licks, thus transmitting the affection to the mouth, causing watery blisters. The milk becomes affected, and while it is said to be quite possible for a person to become affected the results are not regarded by the farmers as particularly dangerous. It is said that a cow once affected may recover

but always retains an affectation similar to distemper in a horse, so that every effort is made to stamp the disease out completely.

Thousand Dealers Registered at Toledo

The number of visitors at the 1915 Toledo automobile show, compared to visitors at the automobile show in 1914 was better by 20,000. The gate receipts this year at 25 cents, as compared with last year at 50 cents, produced about \$600 more. There were about 1,000 dealers registered, which is nearly double what it was any other year. These were largely from northwestern Ohio and southern Michigan. From a business point of view the show was about 100 per cent better as a matter of actual sales than a year ago. Dealers have almost as a unit signed an agreement to go into a show in 1916.

Omaha Business Exceeds \$16,000,000

Dairy City Show Reveals Rapid Upward Trend in Trade —Territory Covers 100,000 Square Miles of Rich Farms

LAST year, Omaha distributors and dealers in motor cars and accessories sold \$16,026,750 worth of merchandise through the Omaha territory, a good round sum for this city with a population of 200,000 including Council Bluffs, and such other suburbs as Benson, South Omaha, Florence, and Dundee.

Omaha is not seriously considered by many as a motor car distributing center in comparison with Minneapolis or Kansas City or Dallas, yet figures speak eloquently in proving this to be a center of proud proportions, a city that lies nestled in the heart of the grain belt and a city whose motor jobbing business of slightly over \$16,000,000 per annum compares favorably with Kansas City, whose jobbing trade per annum reaches \$39,000,000.

Spend a few hours with Omaha car dealers and finish up with half a day at the Commercial club and you will be started on the road to conviction that Omaha is being heard from and will make a louder noise in the future.

The Wealth of Omaha

Omaha ranks as the third live stock and packing center of the country, being led only by Chicago and Kansas City;

Omaha is the fourth primary grain market in the United States; and is second as a corn market;

Omaha leads all other cities as the greatest dairy city in the country;

Omaha has one of the largest gold and silver smelters in the land.

Last, but not least, the annual grain report shows the state of Nebraska stands fifth in total value of crops for 1914. Here are the figures:

State	Crop value
Iowa	\$351,450,000
Illinois	319,656,000
Texas	290,335,000
Kansas	287,662,000
Nebraska	210,099,000
Missouri	192,981,000
Minnesota	180,432,000
South Dakota	106,488,000

Is there any reason why the citizens of Omaha, during last week, when the motor car show held the boards at the auditorium, should not laud the value of this city in the retail automobile field. For 10 consecutive years the show has been held in the same hall and under the same management. Clarke G. Powell, of the Powell Supply Co., managed the first show and still wears the crown of per-

ennial management. The first show had six exhibitors but last week there were forty-five, thirty-three showing passenger cars on the main floor and twelve others exhibiting commercial vehicles in the basement. Fifty different makes of passenger cars were shown and sixteen different makes of motor trucks. There were no accessories.

Only Dealers Admitted

Omaha holds a closed show. Exhibitors must be bona fide dealers, located in this city and with a real salesroom and a legitimate leasehold before they can get on the exhibition floor. This is due to the constitution of the Omaha Automobile Show Association, a \$50,000 corporation, which sells stock at \$50 per share to bona fide dealers. One share of stock entitles a dealer to exhibition privileges. Forty different dealers are members and all forty were in the show last week. Manager Powell says that not in 10 years of Omaha show history has there been more than one of the members of the association absent from the show. Outside makers were here last week trying to pick up last-minute space, but they found the bars up. No salesroom, no space is the cast-iron rule of the show. Here the outsider who would like to wait for the show week to launch his cars before the public is not welcome, but let him take up his residence here, open his salesroom, conduct a real business and at once he becomes part and parcel of the show organization.

Largely a Dealers' Show

Like Minneapolis and Kansas City, the Omaha show is largely a dealers' show. There are over 4,000 motor car dealers in this territory, and of these almost 2,000 registered. A year ago 1,400 attended. Next year the number probably will be 3,000. Many of the dealers attending last week brought two or three prospects with them. Some paid their railway fares, others did not. Many of these dealers closed two or more sales.

Locally, the 200,000 population of Greater Omaha is a potential buying power and many retail sales were closed during the week. This is not the opportune time for retail sales; it is a little early, November, December, January and February being the dead months for deliveries. Deliveries start March 1, almost a month earlier than Minneapolis, and continue until the end of October.

Before endeavoring to analyze the Omaha selling field it is necessary to appreciate the territory served by this city. This territory embraces the entire state of Nebraska, the three western tiers of counties in Iowa, and with some dealers the lower half of South Dakota. This is an agricultural zone of no mean proportions. It aggregates a total area of 100,000 square miles, all the best farming land of the country. This area is one-half greater than all of New England. It is double the area of New York state. You could place a dozen New Jerseys in this zone. It is a little greater than Illinois and Indiana combined.

The potential buying ability of this zone is appreciated when you recall that Nebraska stands fifth as a grain producing state, that Iowa is first, and that one-quarter of Iowa comes in this zone.

Money in Sight

Pause and analyze the crop status of Nebraska for the past year, bearing in mind the high grain prices now prevailing and also the fact that the surplus crop money is largely going to be spent in motor cars and farm implements. Last year the Nebraska wheat crop was 142 per cent normal, or 42 per cent above the average crop for the last 5 years.

The oat crop was 130 per cent of the 5-year average; corn was below normal, being only 82 per cent of the average for the last 5 years; alfalfa was 130 per cent; and hay fell below the 5-year average, being a 90 per cent crop. Here are the figures:

	Average crop 5 years, bushels	1914 crop, bushels	% of aver- age
Wheat	49,079,400	69,732,953	142
Oats	54,836,200	71,413,531	130
Corn	183,201,200	150,235,060	82
	Tons	Tons	
Alfalfa	1,973,820	2,689,613	136
Hay	5,544,749	3,015,575	90

These figures have meaning only when the increase for 1914 is seen. For 1915 prospects are even brighter. The state has been well clothed in snow, the ideal condition for wheat; the crop acreage is larger than ever before and a banner year for 1915 is already fairly well assured. Prices are sure to be high, even if the war comes to an unexpected end.

If the farmer were not the big buyer of motor cars it would be useless to quote crop figures such as these, but this is the granary of the world and if you

would get your finger on the pulse of industry you must get your mind firmly fixed on the crop situation and get the figures into your head.

A. A. Murphy, president of the Murphy-O'Brien Automobile Co., distributor of Paige and Dodge cars, will sell two-thirds of his output to farmers; G. L. Dingman, sales manager of Stewart-Toozer Motor Co., selling Chalmers and Pierce cars, sells 10 per cent of his machines in Greater Omaha and the remaining 90 per cent go to his majesty, the farmer. The farmer sales are well assisted by the fact that there are good strong banks in the small towns in Nebraska as well as western Iowa, so that sales are largely cash, the banks arranging for any accommodations that the farmer may require.

Business Rapidly Growing

J. R. Jamison, local Overland distributor, has a small territory, twenty-six counties in Northern Nebraska and four counties in South Dakota, yet a week ago he had a train load of Overlands arrive, thirty-two freight cars carrying 126 machines. This was the first time such a train load of Overlands had reached this city. Jamison got the territory last autumn, yet seventy of these cars were sent direct into the territory and the other fifty-six into storage in this city. Jamison has already twenty-eight dealers, by May 1 hopes for forty, and he spends practically all of his time going through the territory.

For the last 10 years the motor car jobbing business has been growing very steadily not only in Nebraska but in western Iowa and the lower part of South Dakota. Figures compiled by the Commercial club of Omaha covering the last 3 years shed interesting light on this growth. Since 1912 the jobbing in cars and accessories has almost doubled, rising from an annual total of \$9,598,750 in that year to \$16,026,750 the present year. Here are the figures for the three years:

OMAHA'S JOBBING TRADE

Cars	\$7,289,976	\$10,891,158	\$12,358,558
Accessories	2,308,774	2,284,500	3,668,192
Total	\$9,598,750	\$13,175,658	\$16,026,750

The increase from year to year is regular rather than spasmodic, and the 1914 figures are encouraging in spite of the war, which had its effect for thirty days in August until the citizens found that farming, dairy, and meat packing was to continue war or no war.

Omaha is a big accessory distributing center, there being approximately eight supply houses that have considerable wholesale and retail business. Manager Powell, of the Powell Supply Co., was not only a pioneer in the car selling field in Omaha, but also a pioneer in the exclusive accessory business. Today his

supply house trade is 98 per cent wholesale and 2 per cent retail. But the accessory business growth has not been so consistent as the car business; in fact, 1913 fell a little behind 1912 but the gain in 1914 was most substantial over 1913. The drop in 1913 was largely due to cars, particularly the cheaper makes, being sold with complete equipment, a fact which reduced the accessory field, and makes the showing for 1914 more important.

Omaha is a poor city for electric passenger cars, and as such stands in strong contrast to Kansas City, where the electric is strong. The Omaha citizen cites the hills as being a great reason for few electrics, particularly as the best residential section is all along the hills. Kansas City has its hills but it also has the electrics. Other reasons have been advanced why the electric has not made greater strides here, one being that this city is not a great manufacturing one in the sense that Toledo, Indian-

apolis and some eastern cities are, and that there is not the money. Another is that the zone of travel here is greater than in an eastern city of the same population, and the limitations of the electric are apparent. The fact remains that Omaha is not as yet a strong closed-car center, the gasoline coupe not being a big seller, and naturally the closed electrics are wanting.

Territorial Dealers Attend

As a dealers' show Omaha does not rank so high as Minneapolis and Kansas City, but last week was looked for for many weeks by the distributor and also the out-of-town dealer. The dealer comes to the show. There are over twenty Chalmers dealers in the territory and all were here. The Hupmobile is represented by over sixty, nearly all of whom were present, and during the week not a few new ones signed up. The same is true of Overland, Dodge, and a host of other makes.

Grand Rapids Show Better by 100%

Western Michigan Exhibit Exceeds Last Year's in Attendance and Business

The sixth annual Western Michigan automobile show, which closed February 20 in Grand Rapids, was estimated by exhibitors and promoters to have been about 100 per cent better than last year's show in the way of attendance and sales. There were thirty-one exhibitors of automobiles and twenty-nine of accessories. The automobile dealers and distributors showed thirty-six different makes of passenger cars and eight of commercial vehicles.

It is claimed that during the show the retail business in cars totaled between \$300,000 and \$350,000 and that if the wholesale sales are added the total amount of sales will be fully \$600,000.

A large percentage of the cars sold at retail were disposed of to out-of-town visitors. Overland sales furnish a good example in this matter, as out of twenty-seven cars which had been sold up to Friday night only six were purchased by people living in Grand Rapids.

Sales Were Excellent

Some idea as to a day's total sales cannot be accurately given because many dealers refuse to furnish such data. From those who did it was shown, for instance, that on Tuesday, February 16, there were sold five Chevrolet and five Monroe cars, one Hudson, one Paterson, two Peerless—a six and a four—three Paige, six Studebaker—five fours and one

six—one Kissel and one United Motor truck. The sales on Thursday, February 18, included two Baker electrics, two Franklin, one Buick, two Chalmers sixes, five Reo, eighteen Ford, one Mitchell four, one Case, two Hudson sixes, one Republic truck, two Jeffery sixes.

As for the accessory business, it was reported better than at any previous show, one dealer reporting retail sales of \$4,800 and contracts totaling \$25,000.

Many Dealers at Show

The number of dealers who visited the show totals several hundred, and they came from every locality of any importance within a radius of 200 miles from this city, as for instance, Muskegon, Ionia, Port Huron, Battle Creek, Manistee, Cadillac, Traverse City, Lowell, Coral. C. R. Clark, of the Michigan Motor Car Sales Co., Cadillac, dealer in Chandler and Ford cars, brought sixteen prospective purchasers with him to the show.

While there were no surprises in the way of new passenger cars there was one newcomer in the commercial field, the United Motor Truck Co., which is a new local concern, and makes 1½-, 2-, 3- and 5-ton trucks. The 1½-ton truck, which costs \$2,150, is worm-driven; the 3-ton model is listed at \$2,750 with chain drive and at \$2,950 with worm drive; the 5-ton truck costs \$3,400 and has a chain drive.

Wet Course Causes Vanderbilt Postponement

Not Even Planking of Dirt Section of Course Overcomes Influence of Rain—32 Entrants to Line Up March 6

San Francisco, Cal., Feb. 22—After battling with the elements for almost a month, the Panama-Pacific Exposition Race Committee was finally defeated with 100,000 spectators lining the course, when the Vanderbilt cup race was called off at noon today, because of a wet course.

The drivers entered in the two great motor classics mobilized in San Francisco and waited impatiently for a chance to try out the dangerous but spectacular course. It was finally decided to plank the dirt track section of the course in order to give the racers a chance to work out.

Planks Cover Dirt Section

An army of carpenters was turned loose on the three-quarter mile dirt stretch and after working three shifts day and night for three days, the exposition opened. The day the fair opened, San Francisco was blessed with perfect California weather, but there was no chance for the drivers to work with 211,000 people swarming over the grounds. A meeting of the drivers was called, and it was announced that practice would be held from daylight to nine o'clock Sunday morning.

The first practice was featured by two wrecks. Eddie O'Donnell, driving the Duesenberg No. 19, was one of the first on the course. Driving through a gate at the far end of the great park, he saw that the guards had been stationed and started around. The Duesenberg made fast time on the asphalt and went on to the boards on the turn at about forty miles an hour.

During the night a heavy frost had whitewashed the planked track and the boards were as slippery as ice. O'Donnell battled with the wheel until he reached the center of the turn, then skidded through the outside fence. His car landed fifteen feet off the course and turned end for end in a ditch.

O'Donnell Slightly Hurt

The mechanic was but slightly cut up while O'Donnell suffered painful bruises about the body and a large cut below the eye. The practice was then called off until the sun came out.

Within an hour, the frost was off the boards and practice was resumed. The mud and slush under the boards came up through the wide cracks in the planking as the heavy cars went over the timber

and soon the boarded course was a muddy skid bed. T. Tomasini put on his brakes in front of the grandstand, just as he hit one of the mud beds and ended the practice by crashing through the pits on the inside of the course.

The race officials contended that the

DRIVERS WHO WILL START

Driver	Car
Gil Anderson.....	Stutz
Earl Cooper.....	Stutz
Howard Wilcox.....	Stutz
Dario Resta.....	Peugeot
Eddie Pullen.....	Mercer
Glover Ruckstell.....	Mercer
Louis Nickrent.....	Mercer
A. A. Cadwell.....	Marmon
Wilbur D'Alene.....	Marmon
Louis Disbrow.....	Simplex
Jack LeCain.....	Chevrolet
R. C. Durant.....	Chevrolet
Barney Oldfield.....	Maxwell
William Carlson.....	Maxwell
E. V. Rickenbacker.....	Maxwell
Edward O'Donnell.....	Duesenberg
Tom Alley.....	Duesenberg
C. R. Newhouse.....	Delage
Jack Gable.....	Tahis
Unannounced.....	Edwards special
J. Paulding Edwards.....	Edwards special
Caleb Bragg.....	Californian
J. B. Marquis.....	Bugatti
Jim Parsons.....	Parsons special
Ralph de Palma.....	Mercedes
Robert Burman.....	Case
E. A. Hearne.....	Case
Arthur Klein.....	King
G. C. Bergdoll.....	Erwin Special
Thomas McKelvey.....	Overland
Harold Hall.....	Hercules
T. A. Tomasini.....	Tomasini

race was to be run, rain or shine, on the day scheduled. At eight o'clock Sunday night rain began to fall, gently at first, but before midnight there was a heavy storm on. When the day broke, the city was drenched and the rain clouds hung all over the race course.

Feared It Unsafe to Start

With umbrellas, the thousands who had purchased tickets filed up into the six great grandstands. On the hill within the reservation of the Presidio of San Francisco, all the soldiers who were not on duty around the course, watched the panoramic display on the flats below.

Every driver felt that it was unsafe to start. There were murmurs of dissatisfaction. P. J. Walker, western representative for the American Automobile Association, who served as referee, announced that the race would be started

at twelve o'clock instead of ten, and the crowds sat silently watching.

Eddie Rickenbacher drove in with his mechanic holding an umbrella over his head. Louis Disbrow wore a long yellow rain coat and carried a set of Weed tire chains. Earl Cooper, Howard Wilcox and Gil Anderson changed the equipment on the rear wheels of the Stutz cars, putting on non-skids.

Ralph De Palma and C. E. Newhouse put Pennsylvania Vacuum Cup tires on the Mercedes and Delage all around. Hughie Hughes said that if it was to be a "Vacuum Cup" race, he wanted to be among the fortunate ones, and put non-skids on too.

Spread Sand Under Boards

While the drivers sat huddled in their coats, the boards were lifted up in several places on the planked section and sand was spread on the slushy surface before the planks were replaced. It was a sorry mess and the drivers predicted a forty-mile race. It was doomed to be the slowest Vanderbilt ever run.

Some of the drivers stated that they would run one lap to save their entry money and then quit the race. Referee Walker finally stated that the drivers would all line up, make one lap very slowly and then take a vote on whether or not the race was to be run.

In the meantime, Chairman Kennerdell made a trip around the course in a touring car and pronounced the track murderous, threatening to withdraw the sanction if the race started. While the officials were in conference, thousands of umbrellas went up and a storm was on. It was all off.

Postponement Starts Wrangle

The drivers were instructed to drive once around the course, for some reason known only to the race officials, and then go home. When the cars crept out of the gate, they looked like veterans of the "Desert Classic." It was at first announced that the race was postponed indefinitely, but later in the day the date was set for March 6. This decision started a wrangle.

The Venice Grand Prix, scheduled for March 17th, is being run under the auspices of the W. A. A. Officials of the Western Automobile Association are here and they protested that to postpone the Vanderbilt to March 6 would interfere with their plans.

Reilly Has an Adventure in a Repair-shop

He Thought the Repairman Might at Least Have Said Hello—But He Didn't—And Reilly Hasn't Figured It Out Yet

By Ray W. Sherman

"TOMMY," said Reilly, as he put on his hat and coat, "let's take a ride."

"All right," responded the youthful salesman in the establishment of C. J. Reilly, Inc., "it's too nice to stay inside."

"Some people seem to be able to stay inside."

They turned toward the little office of Nellie the typewriter chauffeur, but the keys were again clicking merrily, so they merely looked and went out. But as they passed toward the door to the garage Tommy looked back, whereupon Nellie stuck up her nose in the most



"There it is!"

inherit his father's place at the bung starter of the Polski Beer Saloon.

"If we— There it is!" Tommy pointed to a small wooden structure, over the door of which was the compliment—"Garage."

Reilly stopped in front and the two got out. There were two doors. The first one declined to open. The second was less obstinate.

Nobody Home

Inside was what evidently was the office—at least, as compared with the rest of the place it had that appearance. A box stove in one corner—with a pile of blocks as a wooden substitute for one leg—kept the place at a comfortable temperature. In another corner on a shelf reposed an assortment of supplies. The supplies were the best of friends. The body polishes and the spark plugs were in a most intimate relationship and the one pump was making a feeble



"Let's wait. Maybe he's out"

effort to retain its dignity and keep from falling into the riot.

"Well," said Tommy, "there must be somebody here."

"Let's wait a minute. Maybe he's out," advised Reilly.

Tommy looked over the Supply Department and Reilly made eyes at a young lady who thrust her bonneted head through a picture of a tire which formed part of the wall decorations.

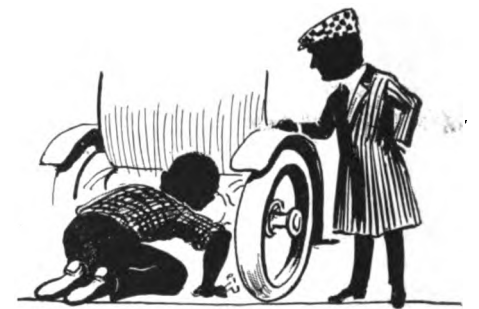
"Gee! But he's a long time coming back!" Reilly looked out the window, semi-frosted with the dust of countless unwashings.

"Why, he can't be far," Tommy pointed. "There's his coat." It lay on a chair in the corner.

"And his hat," added Reilly.

"Maybe he's in the shop. There! I just heard a noise out there!"

To a door which was the only exit rearward they went—and walked through.



.....and returned to the inspection of the axle

He was there all right—as plain as day—once he was located. Near a bench at the far end of the shop two boys turned mechanically at valve grinding. They looked up as Reilly and Tommy entered and turned again to their work. On his knees behind one of the few cars in the dim, cluttered shop, a man in overalls, lamp in hand, poked inquisitively at the brake of a car.

As the two men entered he gave them a tail-of-the-eye glance and returned to the inspection of the axle. It was the right rear brake he was busy with, and from a position near the left rear wheel Tommy and Reilly could see dimly what he was doing.

Watching in Silence

They watched in silence for about three minutes. Then the man shifted his position toward the differential, which cut off their view of the operation. Tommy was really interested in the poking-around operation and, considering himself entitled to see the rest of the performance, moved over back of the right wheel. Reilly followed. The man kept poking.

Tommy was interested in this mysterious hunting-after-something-with-a-wrench-and-an-electric-lamp, and watch-



Tommy looked back

approved juvenile style and kept right on working.

They were out in the street and skimming along before Tommy thought to ask, "Where now?"

"Over to a little repair-shop on the North Side—Willet's, I think."

"What for?" blandly inquired the youth.

"Prospect wants me to look at a Congress car he wants to trade. Says he has been garaging it in Willet's shop."

"Who's Willet?"

"Darned if I know."

Hunting for the Repair-shop

They rode on and on, over streets from which the sun had taken the snow and ice of winter and down through thoroughfares which were seldom graced by the presence of a car except as factory dignitaries rolled to and from their offices or an artificially prosperous celebrator came home in style at an hour when there was no one up to see him.

"Some place for a repair-shop!" remarked Tommy.

"Yes—some," agreed Reilly, as he yanked the emergency brake lever and thereby prolonged the existence of Stanislaw Petranowski, who some day, when he grew up, might be expected to

ed carefully. One of the valve grinding youths looked up now and then and in lieu of a better pastime Reilly strolled over to the scene of this operation, pausing on the way to inspect a veteran of the industry which was loaded to the rail with old tops, seat cushions and tires which has passed tire dotage.

The valve-grinding lad became busier than ever as Reilly approached. He did not even look up now, but moved as steadily and automatically as a pendulum. Reilly had to admit the kid was a good grinder.

Tommy still continued his course in brake-poking. The man moved back near the right rear wheel, whereupon Tommy moved over back of the left rear wheel. Reilly passed from Valve Grind-



Reilly strolled over

er No. 1 to Valve Grinder No. 2, and concluded that while No. 2 had a little more grease on his face, he was less efficient than Valve Grinder No. 1. Reilly figured that Valve Grinder No. 2 lost two motions every time he wiped his face with his hand.

About this time the man moved over toward the differential, so Tommy moved over back of the right rear wheel, but before Tommy could get established in this new position the man moved back again, then reversed, moved again and very much disconcerted the audience generally.

"There ought to be a law," thought Tommy, "against a man moving around like that." But there was not a law. The man moved again.

Tommy Has to Maneuver

"Gol darn yuh!" said Tommy to himself, "I can keep this up as long as you can—" And he countermoved with supreme skill.

"There! Darn yuh! Tired you out! Didn't I?" was Tommy's mental jibe as the man settled down near the right rear wheel and Tommy took up a position back of the left rear wheel.

Valve Grinder No. 1 favored Tommy with a look. Reilly poked with his toe at something round and shiny on the floor. It turned out to be a well-worn $\frac{3}{4}$ -inch washer. Valve Grinder No. 1 looked at Valve Grinder No. 2. No. 2 looked in the hole, wiped some more grease on his face and resumed grinding.

The man made a dive under the rear end of the car and came out with a hammer. He settled down on his haunches, looked at the brake, hit it twice with the hammer, stared intently again and dropped the hammer on the floor. Then he unwound the lamp leader from around his right foot, relocated the wrench and poked some more at the brake.

"Most mysterious," said Tommy to himself.

"He does seem to be in trouble," replied himself to Tommy.

Reilly strayed off over to a far corner of the shop, where there reposed a 1912 Congress touring model. He inspected the body, peeked at the dash and said—to himself—"Worth about three hundred dollars, according to the Chicago Association's Central Used Car Market Report, and I guess that's about right."

Tommy Loses Interest

Tommy was losing interest. What good would it do, he figured, if he did find out what the man was trying to do. He might better be using his energy trying to figure out why old T. G. Blossom was so long making up his mind to buy a Sennett car. So Tommy went over to the Valve Grinding Department.

"Is that Mr. Willet?" asked Tommy, after watching Valve Grinder No. 1 for four minutes.

"Yes." The grinder never lost a movement. Neither did he look up. Tommy wandered over to where Reilly was standing beside the Congress.

"That's Willet," he said soto voce.

"Umhump."

Tommy went back for further instruction in brake poking. Reilly joined him.

They had spent about twenty minutes in the shop and Tommy considered that the proper length for a formal call at that hour of the day. He went back into the office and stopped in front of the bonnetted tire maiden.

"Hello kid!" he said. She continued to smile.

"Keep away from that girl!" ordered Reilly, who walked in from the shop.

"Going?"

"Yep."

"Aren't you going to say good-bye?"

"Haven't said hello yet, have we?"

Reilly pushed the starter lever and the Sennett moved up the street by Stanislaw Petranowski's beer saloon and toward the part of the town from whence they had come.

"What's that?" Tommy looked back, put his hand on Reilly's arm and indicated that they stop.

"Wait a minute!" called Valve Grinder No. 2, running up the street. He came alongside.

"Did you want something?"

"Why—I don't know—what have you

got?" Reilly looked the youngster over. "Why—why—nothing—ah—you see—that is—"

"What is? What do I see? Spit it out!"

"Pa sent me after you to see if you want anything," blurted the lad.

"And if I do I suppose I'll have to come back and stand around half an hour before I get it! Is that the idea?"

"No, I guess not. I—"

"You guess not!" Reilly almost shouted. "You guess not!" Well, we stood around for twenty minutes, didn't we?"

"Why—Why—" faltered the lad, and he wiped some more grease on his face, "Pa was busy and thought if you wanted anything very bad you'd say so. He—"



"Wait a minute!"

"Billy!" The lad started. "Come back here! I didn't tell you to go a mile!"

"So long," said Valve Grinder No. 2, wiping more grease on his face.

Reilly Soliloquizes

"So long," said both Reilly and Tommy.

"Do you wonder some people don't make a go of it?" Reilly shook his head dubiously in answer to his own question.

"Do you wonder?" Reilly repeated.

"The idea of leaving an office absolutely unattended. He might at least put a bell on the door if he isn't able to keep someone on the job in the office, and when the bell rings he could step to the office.

"Or he might leave a sign in the office asking people to step to the repair-shop, and he might label the door through which he expected them to step. He might do any of a number of things, and above all he ought to be gentleman enough to speak to a man who comes in even if he isn't awake to the fact that it is good business.

"Even if I were a bill collector and he knew it and didn't have any money to pay, it is up to him to greet every man who walks into that shop. After we walked out he probably told the kid to see what we wanted, and the poor kid tried to make good for his father's defects."

"Some business man!"

"Some—but not very much," replied Reilly.

Dealer's Legal Status

Untangling a Complicated Repair Job in Which Three Cars
Figure—In Case of Defect Dealer Pays for New
Part, Not for Old One

By George F. Kaiser

Legal Editor, Motor World:

Mr. A. has me get a small car from his residence and wants it repaired. The car is very old and found to be in such shape that the motor and transmission are returned, with Mr. A.'s consent, to the manufacturer of the car. Mr. A. in the meantime with his other car collides with another automobile, and takes the blame of the collision, having both cars taken here and ordered repaired at his expense. Both machines were repaired and I satisfied the owner of the other machine so he would not sue Mr. A. for damages. Both of these cars have been taken from the garage and the bill sent to Mr. A. and a part payment made on it. The manufacturer has returned the parts for the first car, claiming that it is so old that he cannot furnish all the parts needed, and that the motor will cost more than it is worth to repair it. As Mr. A. is unable to pay the bill sent him, no further work has been put on the first car, as I feel the car is not worth it, and the car stands dismantled. Shall I notify Mr. A. to pay his bill and remove the car as it stands, or where do I stand?

Chicago, Ill.

C. L. V.

Mr. A. is indebted to you apparently for work done on three different cars, first a small car which you still have in your possession, second, a larger car,

which he owns, and third, a car which was damaged by him.

As to the work on the second and third cars, that has been finished. The cars have been returned, your bill rendered and part payment has been made.

As you still have the first car which was sent to you for repairs in your possession, you have a common law lien on it for the services rendered in attempting to repair this particular car. This lien does not cover the work done on the other cars.

As your agreement with Mr. A. in regard to the first car was to examine it and, after making an examination you thought it best to send the motor and transmission to the factory, which was done with his approval, and the factory refuses to undertake to repair the motor and transmission on the ground that it cannot furnish all the necessary parts, and on the further ground that the cost will be prohibitive, you may, if you wish, notify Mr. A. to pay his bill and remove his car without breach of contract on your part. You are certainly entitled to compensation for the work done and expenses incurred for him.

If the car is worth anything, why not keep it in your possession until the bill is paid? You have the right to do this as you have a common law lien in your state. Notice should, of course, be given Mr. A. to pay and remove his car.

MAKER ENTITLED TO PAY FOR PART

If Defective Part Is Replaced Dealer Is Rightly Charged for New One

When a dealer agrees with a manufacturer that defective parts will be replaced by the latter, and that a bill for the amount of the new parts is to be sent to the dealer, and that he is to be charged with that amount until the old part is returned, the dealer must pay for the new part and not for the old part when the defective part is not returned to the manufacturer.

An action was started by a motor car manufacturer to recover the purchase

price of a motor. The dealer and the manufacturer had entered into a "Dealer's Agreement," giving the dealer exclusive right in certain territory. A provision was as follows:

"The dealer agrees that, in consideration of the manufacturer furnishing free of charge, under the terms of such guaranty, such new parts as may be required to make replacement on the cars of customers within his territory, that he will pay the transportation charges on all

such parts so furnished from the place of the manufacturer, or branch house, to the place of delivery to the customer entitled to receive the same, and also at the option of the manufacturer return to it such so-called broken or defective parts replaced, on which the manufacturer agrees to pay the return transportation charges. Such parts replaced by the dealer and claimed to be defective or broken, shall be subject to the inspection and approval of the manufacturer . . . if any part, or parts, of this car break or prove defective within one year from any cause whatsoever, and the customer shall forthwith communicate the facts to the manufacturer, or one of its authorized dealers, giving the number of the car and the name of the dealer from whom the car was bought, and the date of purchase, and if it shall appear that such breakage was not in fact due to the misuse, negligence or accident, the manufacturer will furnish such new parts, either at a branch house, or at its factory in Detroit, free of charge to the owner."

The dealer sold a car and it afterward appeared that its motor was defective. The manufacturer shipped a new one and, according to its usual custom, a bill in the sum of \$410, which was marked "Charge to same, pending return." It was explained that the dealer was charged with \$410 until the old motor should be returned, at which time he would be credited with that amount. The new motor was put in the car, for which it was intended, but the old motor was never returned to the manufacturer, who thereupon sued the dealer for \$410. The dealer contended that, as the defective condition of the motor was the fault of the manufacturer, and he had rendered services upon the machine of the reasonable value of \$182.15, that amount should be credited to him. He also contended that he should only be charged with the price of the old motor.

The court held that he was entitled to the \$182.15, but the manufacturer should have a judgment for \$227.85, as it was entitled to the price of the new motor under the agreement. The court explained that the effect of the dealings between the parties was equivalent to their saying—"you return the old defective part to us, or pay us the price charged for the new part," and that the price charged was the amount of damages agreed upon in case no return of the old part was made.

The court further said that this was no hardship on dealers who returned defective parts, but at the same time it adequately protected manufacturers, as in most cases the latter would be unable to prove the value of defective parts because they had not been in their possession since they were new; and, further, that if the cash penalty attached to a dealer to return an old part was a payment of what a jury might assess its value, there would often be strong inducement to make purchases of old parts upon such terms. (*Company vs. Gollmar*, 150 N. W. (Wisconsin), 442.)

Advanced Maintenance

BRAZING AND WELDING

By George Fernwell

(Continued from last week.)

The statement that skill and experience, proper conditions of flame and flux and scrupulous cleanliness are necessary to permit a thorough amalgamation or union of the spelter with the surfaces to be united, holds good for all kinds of brazing work regardless of the hardness or softness of the spelter used, but applies with especial force to a repair in which the work must subsequently withstand severe strains. In such a case it is advisable to use the hardest spelter. The spelters ordinarily supplied when no particular degree of hardness is specified melt so readily that when used for brazing steel or iron parts together the process is very little more difficult than ordinary soft soldering.

Hard Spelter Makes Strongest Joint

A fairly safe assumption in general is that an easy flowing spelter is a weak spelter, relatively speaking; therefore, work brazed with such spelter when the parts joined are iron or steel cannot be relied upon to long withstand vibration or the strains of leverage, as in the case of repairing by brazing the broken speed lever, different methods of repairing which were discussed a short time ago, or in brazing a flange or a branch to a steel exhaust pipe.

A rough classification for the use of various degrees of hardness of spelter

ings, exhaust pipe flanges and branches, etc. The ordinary hard spelter, half copper and half zinc, should be used for copper inlet and water manifolds or for brazing on flanges or branches. Soft

On the other hand, wherever the surface of the red hot metal is coated with melted borax, there will the fully melted spelter readily flow and spread and adhere. Adjacent surfaces not coat-

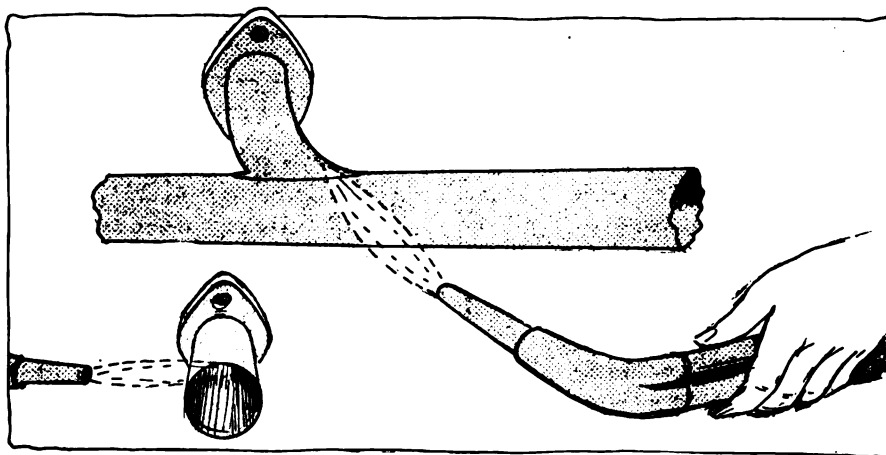


Fig. 2—When the joint has become nearly hot enough for brazing the risk of burning the metal will be greatly decreased if the blowpipe flame is directed across the pipe, brushing it rather than impinging directly on the surface

spelter, consisting of one part tin, four parts copper and three parts zinc, should be used for brazing brass to iron or copper, and the very softest obtainable, two parts tin and one antimony, for uniting thin sheet or cast brass.

While the theory of the use of spelters of varying degrees of hardness is given as information strictly pertinent to the subject of brazing, trouble may be experienced in applying it to actual work, owing to the difficulty in general of obtaining spelter other than that composed approximately of half zinc and half copper, although the latter is furnished in large or small grains, while for the lightest class of brazing work, such as thin sheet brass, easy flowing alloys, called grey solder, or else black solder, only can be obtained.

Good Flux Necessary for Good Brazing

The term flux is applied to the substance used in brazing to protect or clean the surfaces that it may be required to braze together from the oxidizing effect of the flame while heating the work to a brazing temperature.

Without a suitable flux it is practically impossible to effect a proper adhesion of the melted spelter to the surfaces to be united.

ed with borax will apparently repel the melted spelter in a similar manner to that in which water would be repelled from a grease-covered surface.

Strictly pure borax (not what is termed commercially pure borax) is the best flux known for nearly all classes of brazing. Other fluxes are used for cast iron and these will be discussed later.

Excess of Borax Difficult to Remove

Pure borax gives considerable trouble in filing up the joint after brazing, more especially, however, if borax is used excessively or carelessly; that is, if the metal surface for a considerable area adjacent to the joint is needlessly smothered with borax. The surface, when the work is cooled, will be coated with an intensely hard glaze, very wasteful of labor and ruinous to files in removing it.

There are preparations of borax to be obtained ready for use which leave practically no glaze on the exterior of the work after brazing.

Some, if not all, of the prepared fluxes contain acids, which are presumably effective aids in the actual process of brazing, but the corrosive effect of the acids retained within the brazed joint may generally be considered ultimately weakening in their action.

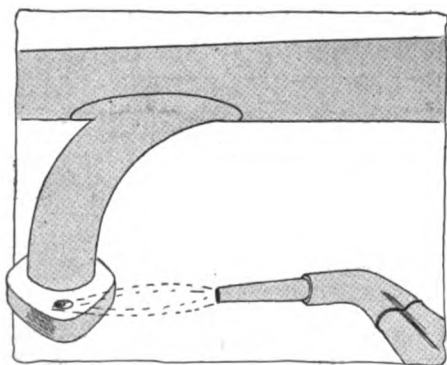


Fig. 1—When brazing a steel flange to a copper pipe the blowpipe flame should be directed at the steel flange, not at the copper

may be given as follows: The hardest spelter, containing three parts of copper and one of zinc, after skill and experience have been acquired, is preferable for brazing iron castings, such as cylinders of waterjackets, steel axle hous-

To prevent scaling or glazing of the work when using prepared fluxes, the brazed joint after cooling sufficiently to set the spelter but while still red hot, may be immersed in cold, soapy water. The soapy water is preferable in order to avoid the hardening effect of plunging red-hot steel in clean cold water.

To remove or prevent the glazing effect of pure borax the brazed joint while red hot may be quickly and vigorously cleaned with a wire brush.

For a particular repair requiring steel or iron broken parts to be brazed together in as perfect a manner as possible, that is, under conditions permitting the strongest union of the spelter with the parts being brazed, the pure borax is preferable.

The simplest way to insure its purity is to obtain borax in lump form. The lump borax should be crushed or pulverized with a mortar and pestle, or by a similar means, and sifted through a fine mesh or gauze sieve or sifter. The borax should be baked or burnt slowly to free it from the water it contains.

Extreme Cleanliness Essential

Borax that has not been baked or burnt so as to eliminate moisture will swell or blister in use as it becomes heated, and will jump or fall off the work and be lost or wasted in the brazing fire.

On the other hand, pure lump borax, crushed, sifted and burnt properly, will melt and flow freely in liquid form, removing any slight residue of grease, if any be present, and equally important to perfect brazing, the flowing borax will remove oxidation of the surface caused in the process of heating.

Notwithstanding the lack of thorough attention to the above suggestions, a workman may succeed in "filling up" the joint with melted spelter so that apparently he may have produced as strong and perfect a brazed joint as is possible. Except by chance the latter could only be apparently the case, for the reason that the tenacity with which the broken parts may be held together by the spelter depends mainly upon the degree of cleanness and freedom from oxidation of the surfaces being united at the precise time at which the latter and the melted spelter are at brazing heat.

Brazing With Gas Blowpipe

From discussion of the items of equipment and material used in brazing we may next, after a brief summary, consider the actual process of brazing.

The blow-pipe, or a forge with charcoal or fire-bricks, are required for effectively heating the joint to be brazed. Spelter of a hardness best suited to the work in hand, or the most suitable spelter that can be obtained, lump borax, pulverized, sifted and calcined, or any of the non-scale preparations of borax sold by machinists' supply stores or sheet

metal warehouses, are needed, and also a spatula or brazing rod made from quarter-inch round iron or steel rod.

To proceed to the preparation for and process of brazing: Thoroughly clean the parts to be brazed from grease or rust. At least all that portion must be cleaned which it is expected to place in the fire or subject to the flame of the

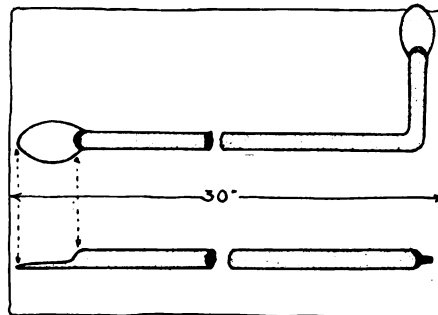


Fig. 3—Spelter and borax are applied with a spatula about 30 inches long made from quarter-inch steel rod with flattened ends

blow-pipe, as well as the actual surfaces to be united.

Grease may be removed from the parts by immersing in lye or potash or by heating and burning it off first and then brushing the grease residue off with a wire brush.

Make a thin paste of burnt borax and water and brush with the paste the two surfaces to be joined together.

See that the two surfaces to be joined fit together in as close contact or as tightly as possible.

It is necessary to emphasize the latter on account of a somewhat prevalent idea that surfaces to be brazed must be kept a definite distance apart to permit the melted spelter to flow between.

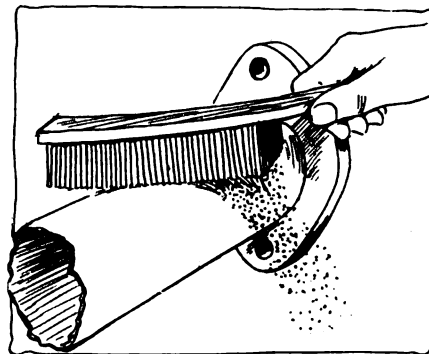


Fig. 4—While the joint is still hot after brazing, the excess of spelter and borax may be cleared off with a steel wire brush

Experience proves the latter assumption to be incorrect, and further proves that when brazing is properly performed the melted spelter will penetrate completely between two metal surfaces in actual close contact at every point of their abutment.

Also while no actual data is immediately available in support of the following statement, it is given as a matter of opinion that the thinner the film of

melted spelter with which two surfaces are united at all points of the area of abutment, the stronger would be the brazed joint.

With the parts to be united fitted in close contact as recommended, arrange the work on a forge or brazing hearth in a manner which will give a most convenient access to the joint, provided the joint be in such a position that the melted spelter penetrating the joint will flow downwards.

Surround the joint with fire-bricks or charcoal for the purpose of retaining or increasing heat and also for the protection of the joint when heated from the cooling effects of draughts. One or more openings must be left between the fire-bricks or charcoal to allow the blow-pipe flame to reach the work.

Spelter Put on With Spatula

By means of forge or of blow-pipe flame, bring the joint to a red heat; in the case of a blow-pipe and charcoal the blow-pipe flame should be played at first on the charcoal surrounding the joint, instead of directly at the work. Having once obtained a mass of red-hot charcoal around the joint, the flame may then be applied directly to the work with better results.

With the joint at red heat, dip the red-hot pointed end of the spatula in borax and apply the latter to the edges of the joint wherever accessible.

Having observed the newly applied borax to have melted and flowed freely into and around the outside of the joint, the spatula may next be dipped in spelter or a mixture of spelter and borax and applied directly over the uppermost accessible part of the joint.

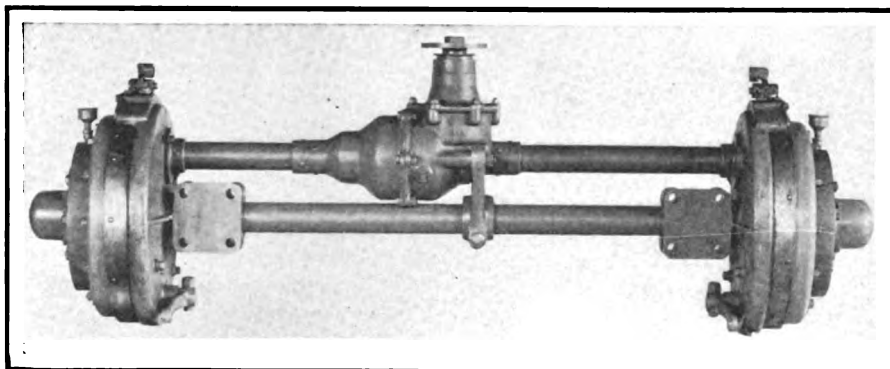
The spelter which for the moment indicated may be adhering to the pointed end of the spatula can be very readily melted with the blow-pipe flame even though the metal parts being joined may not have been brought to a heat sufficient to melt spelter brought in contact with them.

Correct Heat Absolutely Necessary

A joint could apparently be brazed by simply melting the spelter on the spatula and causing it to fill up the insufficiently heated joint as if the spelter were lead and the joint a mould. Such a joint would be as weak as if soft-soldered.

The condition to aim at is that of the metal parts to be joined being just sufficiently heated to fully melt the spelter unaided by the application of the blow-pipe flame directly to the spelter.

A result to be expected under the first-named conditions of insufficiently heated metal parts is that the spelter upon being melted by the blow-pipe flame may penetrate the joint but not to sufficient depth, because the interior surfaces of the joint would be too cool to permit the spelter to flow freely.



A feature of the new Russel internal gear drive rear axle is the small size of the differential housing; the gears are almost 1 to 1. Almost the whole of the 7.4 to 1 reduction is obtained in pinion and internal gear of the final drive

Russel Axle Has Internal Gear Drive

Designed for 1-ton Truck, Weighs 495 Pounds and Has 7.4 to 1 Reduction—Carrying and Driving Axles Distinct

After more than a year of development, the Russel Motor Axle Co., Detroit, has brought out a 1-ton internal gear-drive rear axle. Its entire attention has been devoted to this type and the concern is now in position to supply the design commercially.

The internal gear-drive principle is

not new, though up to now its advantages have been largely overlooked. Now, however, much attention is being devoted to it, several truck makers having adopted it as standard equipment for their machines.

The Russel unit combines a forged steel fixed axle which carries the load

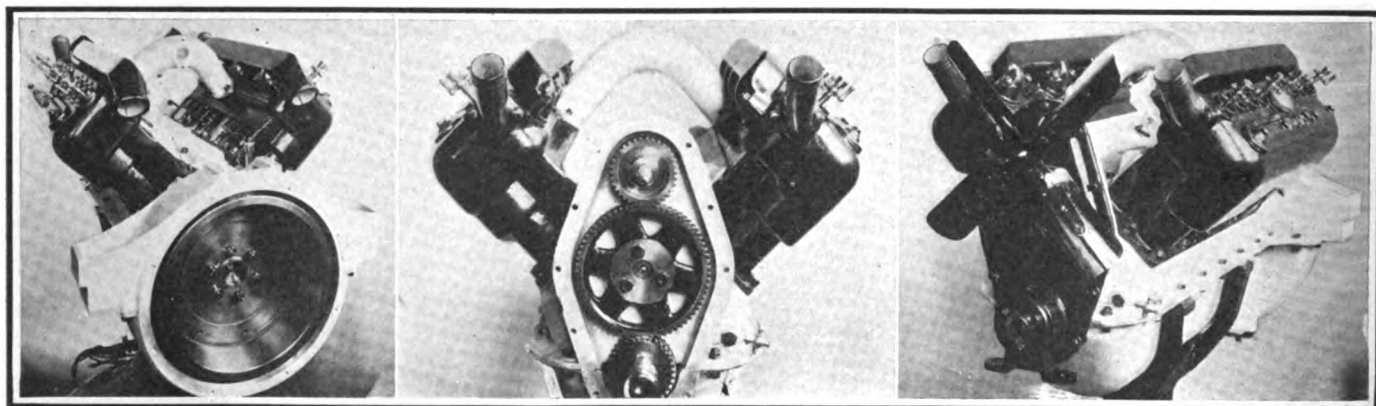
with a light, high-speed jackshaft, driving direct through pinions and internal gears attached to the road wheel hubs. The driving member is ahead of the dead, load-carrying axle, and all driving parts are enclosed.

The drive shaft runs directly back from the gearset in the usual way and connects to the driving member. In this member there is a differential unit, each axle shaft running out to a pinion in mesh with the internal gear attached to the wheel drum, which in turn connects to the spokes of the wheel.

An advantage of the construction is in the small diameter of the bevel ring gear which carries the differential gears. The use of pinions and gears at the wheels obviously admits of any desired gear reduction at this point rather than at the bevel gear, and hence the latter may be made of a size which gives almost a 1 to 1 ratio. This makes the housing for the differential gearing very small with consequent minimum weight and compactness. In the standard Russel type the total reduction is 7.4 to 1 between propeller shaft and wheels, most of this coming at the wheels. The total weight of the axle complete is given as 495 pounds.

The maker states that the axle is specially designed to have the torque and drive taken through the springs, thus avoiding all torque and radius members and cushioning the entire transmission system.

Buda Eight With Staggered Cylinders and Thermo-syphon Circulation



The Buda eight-cylinder motor differs from most of its class in two important respects. The connecting-rods are not yoked at the crankpin, but each has its separate bearing on the long pin; this necessitates the slight staggering of the cylinders. The other unusual feature, for an eight, is that cooling is by thermo-syphon; a separate water lead runs from the radiator to each of the cylinder blocks and the return connections also are separate. The arched intake manifold is water-



jacketed from one cylinder block to the other, forming a water connection between the blocks. Cylinders are 3 x 5½ and are the only cast iron parts; the crankcase is of aluminum alloy and the weight of the engine is said to be 550 pounds. The valves have a clear opening of 1½ inches and are actuated by a single camshaft. The crankshaft runs in three bearings. The bearings are lubricated by force feed from a gear pump. Starting-lighting equipment is provided for between the blocks.

QUESTIONS ANSWERED

Plans for One-story Garage and Repair-shop

Editor Motor World:

We have a small garage about 25 x 50 and are considering a new building about 50 x 80 and would like plans for something suitable for our use. We have in mind to divide the building, making a salesroom about 55 x 50 in front, with a rear room about 25 x 50 for garage and repair-shop.

Atwood, Kan. Howard Auto Co.

Three plans are reproduced herewith, any one of which may prove suitable for your use. Fig. 1 is the best design, for it allows the maximum storage space for cars, gives an accessory department and an excellent salesroom and display windows.

Combine Shop and Garage

We doubt the advisability of making the salesroom as large as you suggest. If you make it about 20 feet deep and the full width of the building it will be large enough for two cars, as in Fig. 1. It is well to cut off one corner of the sales room, as shown, because the space can be utilized to better advantage in the garage.

The repair-shop should occupy the rear of the building and the intervening space may be used for general storage. The object in placing the repair and garage departments in one room instead of separating them by a partition is to

allow more or less space to be used for one or the other. If you had separate rooms you might have space for the storage of two cars in the repair-shop when the garage proper would be overflowing.

The salesroom is large enough for two cars, one of which is placed in the window, and since there is also room for an accessory department we are including this in the plan, although you do not mention it. It would seem that you could profitably utilize the extra space in the salesroom by starting an accessory store. The latter takes up one-half of the room and has a display window for showing new lines and a counter and shelves across the diagonal wall. At the back in the center there is a case for clothing.

On the right side of the room there is a table for salesmen and another for prospects and for holding catalogs. The office is partitioned off in the right corner. There is a door into the garage between the office and the clothing cabinet.

Work Bench at Rear

The work bench in the repair-shop is placed along the rear wall, and the cars undergoing extensive repairs are placed directly in front of it. There is space for four or five cars. Behind this row

may be placed another five cars requiring only minor work.

Thus, the cars that remain in the shop only a short time are placed nearest the entrance.

The tool equipment is placed adjacent to the left wall and consists of an anvil, forge, press, drill press, lathe, other equipment, engine and air compressor for tire inflation.

Carburetor Location

Editor, Motor World:

Why is it that gasoline engine makers connect the carburetor to the engine? Why would it not be just as well some distance away and provided with a hot air connection? Why not put the carburetor in a more handy place?

Niagara Falls, N. Y. C. W. D.

There are two principal reasons why manufacturers are placing their carburetors so much closer to the engines than has been the practice in the past. The first of these is to reduce the possibility of condensation in the intake pipe and consequent improper carburetion and waste of fuel; the second reason is to increase accessibility.

Hot Air Intake Common

Not all carburetors are placed directly against the cylinders, which answers your second question by making plain that where the carburetor is placed some distance from the cylinders it apparently works quite as well. It is now quite the general practice to fit hot air intakes, not only to the primary air, but to the secondary air as well, and in a noteworthy number of cases the carburetor is completely waterjacketed as well.

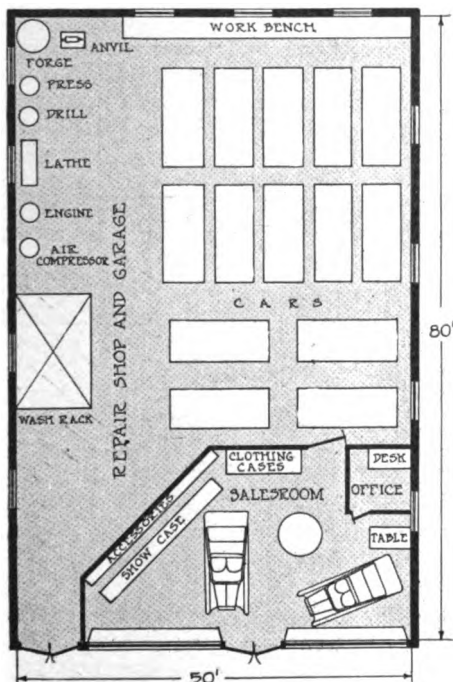


Fig. 1

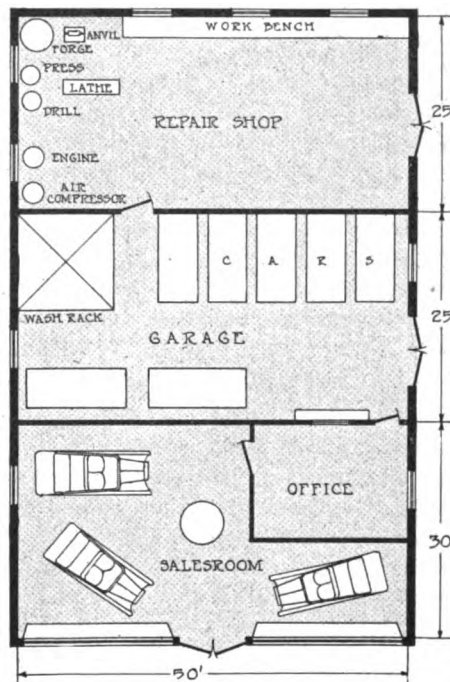


Fig. 2

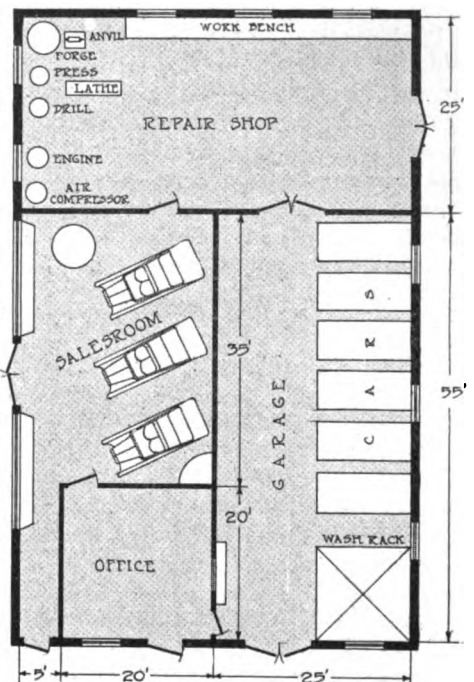


Fig. 3

Three suggested layouts for a single-story combined garage, repair-shop and car salesroom measuring 50 x 80 feet. Fig. 1 shows the best plan, as it accommodates all the departments desired and includes an accessory department as well

HERE IS GARAGE WHICH DOES NOT WATCH DRIVER

Manager Says Car Owners Do Not Desire It—Trade Is Such That There Is General Mutual Trust

The most noticeable feature of the establishment of the United Garage Co., Inc., formerly the Cosmopolitan, New York city, is the absence of any system of keeping a check on the time when cars are taken out and returned. It is explained by E. B. Smith, president of the company, that the class of trade to which the garage caters is of a quality which makes such checks unnecessary. The cars are principally high-priced city cars and are driven by chauffeurs in whom the owners have complete confidence.

The garage, situated on a corner, has a frontage of 50 feet and is 100 feet in depth; it has storage space for 75 cars. It occupies the ground floor, basement and one loft. Another loft is sub-leased to a repair-shop proprietor, who does much of the repair work for the patrons of the garage.

The gas storage tanks are under the sidewalk. There are six, with a capacity of 275 gallons each. There is a portable tank on the street floor and also one in the loft; the basement being used for dead storage no facilities for filling are needed there.

No check is kept on the gasoline kept in the portables except that when any is sold the purchaser is required to sign for what he buys as shown by the gauge. The bookkeeping system is depended on to show any leakage by checking the gasoline removed from the storage tanks. These receipts—Fig. 1—are in duplicate, one of which is retained by the purchaser for checking his bill, and the other goes to the bookkeeper for billing.

For the convenience of chauffeurs a lounging room about 50 x 30 feet has been arranged on the loft floor, and it has a telephone connection from the office switchboard. Lockers for clothing, tools, etc., a separate one for each car, have been built on the street floor.

The former proprietors had figured their service charges by determining, as a starting point, the minimum number of cars which must be on storage monthly per year in order to insure them the minimum amount of profit at which they would be willing to conduct the business. When the business was taken over by

Nº 14800 Tel. (0637) Columbus
(0638)

RECEIVED FROM
COSMOPOLITAN GARAGE
309-311 W. 66th STREET

New York, 191

..... Gal. Gasoline

Pint Qt. Gal. Oil

Pint Qt. Gal. Oil

Pint Qt. Gal. Oil

Charged to

per

Retain this slip
to compare with invoice.

When a customer gets gasoline or oil he signs one of these slips which go to the bookkeeper and are used to compile statements

the United company that data was used in arriving at the charges to be made in the new quarters.

It having been found that an average of 35 cars could be depended on monthly throughout the year, the charges were fixed so that the revenue from that number of cars would pay the expense of the garage. Should only the minimum number of cars be on storage expenses only would be met and the proprietors would depend for their profits on the sales of gasoline and supplies; but if the cars stored exceeded the minimum the excess would represent additional profit.

Including storage, washing and polishing, the charges are \$40 per month for six-cylinder cars; \$35 for limousines and landaulets, and \$30 for touring cars, in use. The charge for dead storage is \$10 monthly. The proprietors claim that while their charges are somewhat higher than others, the difference is more than offset by the advantages of being in a clean, fireproof building.

"Watch Your Step!"

"WATCH YOUR STEP!" is the warning on the 8-inch sills of the doors in the garage of the Packard branch in Chicago. The law requires that in the large sliding doors there be a high sill wherever a small swinging door for individuals is cut through. Once upon a time a man fell over one of these sills, whereupon Manager H. M. Allison had that famous New York subway warning cry, "Watch Your Step!" painted in 2-inch white letters on the sills.

ACCESSORY DEPARTMENT NOW SEPARATE BUSINESS

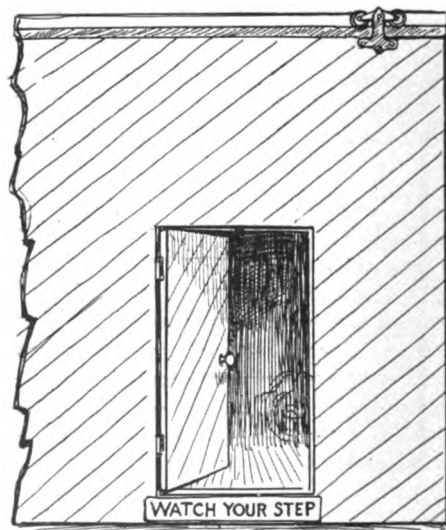
Car Dealer's Venture Assuming National Proportions—Installed Stock Nine Months Ago—Will Become Jobber

His venture in accessories nine months ago having assumed encouraging proportions at the start, C. H. Foster, the Cadillac dealer in Chicago has enlarged this branch of his business until it has been necessary for him to issue a 64-page catalog, through which he intends to expand this business nationally. Twelve thousand copies have been printed and will be sent to all the Cadillac dealers in the United States and to all the Cadillac owners in the territory which is covered by the Cadillac Automobile Co. of Illinois.

Nine months ago the stock was small. Today it is valued at about \$15,000, and is turned over with frequency. The quick turn-over is one of the features of the business; tire chains, for instance, are purchased in lots of 100 and are disposed of within 30 or 40 days. The accessory stock is carried with the parts stock on the second floor, but in the car salesroom and the used car salesroom are show cases which makes it apparent that the company handles accessories.

This company because of the extent to which this business has developed, is able to secure jobbing prices. Some of the accessories distributed are now being made in Foster's place of business, such as seat covers, bumpers and a windshield searchlight.

The department is managed by W. M. Lamp. The catalogs cost about 15 cents each and require 4 cents postage. About 50 per cent of the cuts used in the catalogs were made by Foster, others being secured from the accessory makers.



Warning on door sill in Chicago Packard branch

RECENT DEVELOPMENTS in ACCESSORIES

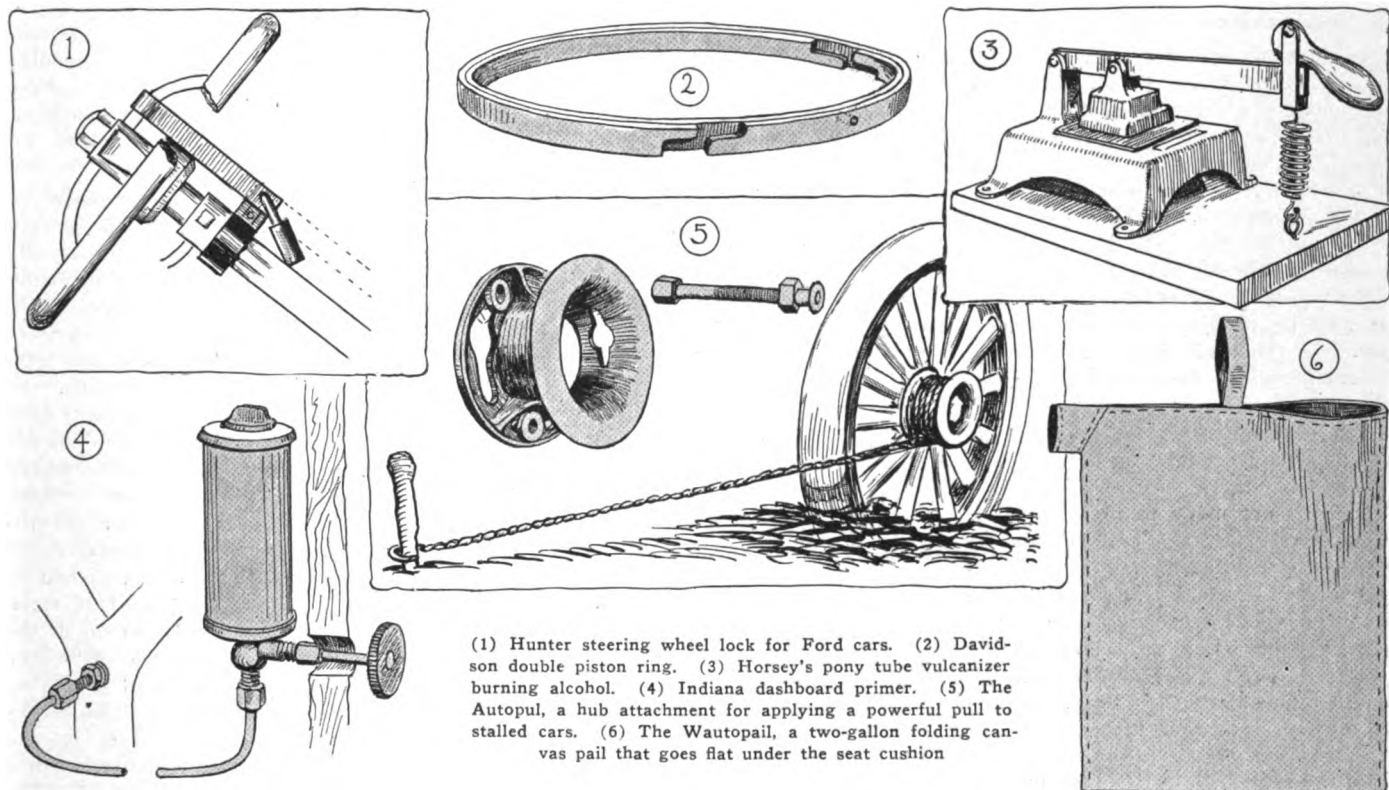
Hunter Lock for Fords

The Ford car lock manufactured by the Hunter Auto Supply Co., Chicago, is of the type which, when snapped in place, prevents the turning of the steering wheel. It consists of a clamp en-

comparatively thin, and thus conform readily with any slight distortion or inequality of wear in the cylinder bore. Despite this flexibility, however, the ring is amply stable owing to its double construction. The makers state that ex-

the tension of which is controlled by a cam operated by a handle. This part of the vulcanizer is automatic in that when the spring is tightened fully the pressure is just right for the work.

An asbestos filling in the lamp, held



(1) Hunter steering wheel lock for Ford cars. (2) Davidson double piston ring. (3) Horsey's pony tube vulcanizer burning alcohol. (4) Indiana dashboard primer. (5) The Autopul, a hub attachment for applying a powerful pull to stalled cars. (6) The Wautopail, a two-gallon folding canvas pail that goes flat under the seat cushion.

circling the column under the wheel, a link connected to one of the spokes and reaching down to a lug on the column clamp, and a padlock which secures the link to the lug. The column band is easily adjusted for height, so that it will be in register with the link, and when the latter is locked in place the bolts which secure the clamp to the column cannot be turned.

The device, including the lock proper, sells for \$1; dealers, 30 per cent.

Davidson's Double Piston Rings

A two-part piston ring which is so made as to be unusually flexible is manufactured by Davidson's Repair Shop, 137 W. 89th street, New York. Each part is a complete ring and one ring is placed within the other; the joints, which are of the stepped or lapped type, are located 90 degrees apart and are held always in their proper relative positions by a small pin in the inner ring entering a hole in the outer ring. Both rings are

cellent results have been obtained from rings installed in old and worn cylinders. All the standard sizes are made, the prices ranging from \$1.25 to \$2 each.

Horsey Pony Vulcanizer for Tubes

The Horsey Mfg. Co., Cleveland, O., is turning out a small tube vulcanizer that is designed especially for vulcanizing Horsey No-cement tube patches; the apparatus is intended for shop use and is mounted on a wood base 8 x 10 inches, protected by a galvanized iron covering.

Alcohol is the fuel used, and a hot plate distributes the heat, there being no water compartment. The working surface measures 3 x 4 inches and is mounted on legs high enough to leave space underneath for the alcohol lamp. The tube is held down on the plate by a circular block 2½ inches in diameter with a concave face, the block being pivoted to an overhead arm. The outer end of the arm is held down by a coil spring,

in place by wire meshing, is soaked with a small quantity of denatured alcohol—2½ teaspoonsful—and this burns 17 minutes, which is the correct time for the cure of the No-cement patches. The lamp is lighted and allowed to burn out, and leaving the tube on the plate for a longer time can do no harm, the makers state. The vulcanizer can be handled without burning the hands. A complete outfit consists of the Pony vulcanizer, 12 Horsey No-cement patches of assorted sizes, sandpaper and instruction sheet, packed in a substantial box.

Price, \$3; dealers, \$2.25 or \$25 per dozen.

Simple Design in Indiana Primer

Something like the limit of simplicity appears to have been reached in the Indiana primer, manufactured by the Engineering Equipment Co., Indianapolis, Ind. It consists merely of a half-pint tank attached to the dashboard—either side—and connected to the intake

manifold by a copper tube; a needle valve at the tank serves to regulate the fuel flow and cut it off. In the under-hood type the handle for the needle valve is on the rear side of the dash, the stem extending through a small hole in the board; in the dashboard type the handle is at the top of the tank. Plain gasoline, gasoline of high volatility or mixtures of gasoline and ether may be used to make the starting of the engine easier.

Price, dashboard type, full nickel finish, \$2.50; under-hood type, \$3; dealers, 40 per cent.

Autopul Moves Stalled Cars

The Autopul, made by the Pillsbury Mfg. Co., Minneapolis, Minn., is a device which enables a car that is stuck in the mud, ditched or otherwise helplessly positioned, to utilize its own power to get out of trouble. A pair of specially constructed winding reels are attached to the hubs of the two rear wheels, cables attached to the reels carried forward and attached to posts, trees or other anchorages, and the motor started. The wheels slipping in the mud cause the cables to be wound, pulling the car gradually out with considerably more power than could be obtained with the motor alone even on good ground, because of the leverage or reduction through the reels.

The reels are made to fit all cars on the market. They are attached to the hubs, when required, by bolts with specially formed heads, forming part of the Autopul equipment. The inside flange of the reel has slots and each slot has an enlarged part; the large openings are brought opposite the bolt heads and the reel pushed back and turned right or left, according to the direction of the pull of the cable. No further fastening is needed. Removal is effected by reversing the process. When ordering, the make and model of car are given, and also the number, location and size of hub flange bolts and diameter of hub cap.

Price, Ford special, jappanned, \$10 per pair; nicked, \$15. Regular model for other cars, same prices. Truck models, \$15 and \$25 jappanned and \$20 and \$30 nickel plated. Dealers, 30 per cent. With pleasure car types 50 feet of rope with hooks is supplied; no rope is furnished with truck models. At \$3 extra a ¼-inch crucible steel tow line with hooks attached is supplied.

Wautopail for Carrying Water

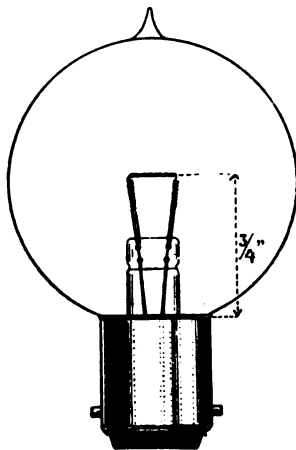
The Wautopail, made by the Pillsbury Mfg. Co., Minneapolis, Minn., is a bag of waterproof canvas which, when not in use, lies flat under a seat cushion and occupies no space. When in use, however, it is a handy pail for carrying water, being made of waterproof canvas and having a spout for pouring

and a strap handle. Its capacity is 2 gallons. The weight is 8 ounces.

Price, 75 cents; dealers, 50 cents. No metal parts are used.

Nitrogen-Filled Headlight Bulbs

Headlight bulbs in which the usual vacuum is replaced by a filling consisting chiefly of nitrogen gas under pressure are manufactured by H. J. Jaeger & Co., Hoboken, N. J. The bulbs are made in four candlepowers—15, 21, 24



Jaeger nitrogen lamps use small filaments to concentrate the source of light

and 32—and for voltages from 6 to 14; both Ediswan and screw bases are furnished, the former being the type commonly used in motor car headlights; single and double wire bases may be had.

Two sizes of bulbs are made, each in two candlepowers. The filament is small and is carried at right angles to the axis of the lamp; the result is that the point of illumination is concentrated and focusing can be accurately accomplished. In the smaller bulb, which is made in the two lower candlepowers, the filament is ¾ inch from the top of the base, while in the larger bulb, which is made in the two higher candlepowers, the distance is 13/16 inch.



The Bell grease gun has an automatically tightening plunger leather

The makers state that the average efficiency is ½ watt per candlepower, which calls for half the current consumption of the ordinary tungsten lamp. The life of the lamp is the same as that of the ordinary tungsten. The price is \$1 for any candlepower; dealers, in unit packages of ten, 33⅓ per cent, and in quantities of 50 to 100, 45 per cent.

Overall Outfits for Car Owners

A special overall apron designed to protect the clothing from grease and

dirt is manufactured by the Jiffy Apron Co., Detroit, under the name Jiffy apron. The garment is best described as being like a pair of roomy overalls with the legs open all the way down the back so that getting in and out is speedily accomplished. A fastening is provided to hold the waist in and the bottoms of the legs are similarly secured so there will be no flapping. A high bib comes up in front with a suspender to go around the wearer's neck.

The apron is made in blue denim, blue and white striped steifel, water-proofed white duck and brown khaki. With each apron is supplied a pair of elbow length sleeve protectors. The price is \$1; dealers, \$8 per dozen. An outfit including the apron and sleeves and also a pair of working gloves and a bag for stowing the set is sold at \$1.25; dealers, \$9 per dozen.

Gun for Handling Heavy Grease

A grease gun that will handle grease as heavy as No. 2 is produced by the Bell Pump Co., Detroit, the ability of the gun to load itself with such heavy lubricant being due to the peculiar construction of the plunger. There are two leather cups in reversed positions. In the lower cup there is a disk with beveled periphery which is pressed upward by a coil spring; the beveled periphery wedges the leather against the cylinder walls, preventing leakage and permitting the drawing in of the grease. Lubricant heavier than No. 2 is packed in by hand. The plunger rod, of ¾ steel, has a heavy square thread cut on it, the thread working in a nut on the cover for forcing grease; when light grease or oil is handled, the thread is released by a quarter turn of a little lever on the cover, when the gun can be used with a straight push. The barrel is of 20 gauge brass tubing. Three sizes are made: 6 x 1¾, holding 5 ounces, price, \$1.75; 8 x 1¾, holding 8 ounces, \$2; and 12 x 2, holding 18 ounces, \$3.25. Dealers, 30 per cent.

Elevation Indicator for Cars

A convenient instrument to show the altitude of hills or the depth of valleys is sold by the Taylor Instrument Companies, Rochester, N. Y. It is of the aneroid barometer type and is designed for dashboard mounting. It has a circular dial with a revolving altitude scale showing, in the standard model, 2,000 feet ascent and 2,000 feet descent, the former in black and the latter in red figures. An indicating needle is centrally pivoted.

A reading is taken by setting the scale so that the zero is under the needle, which is done by means of an external knurled ring. The ascent or descent will then be indicated by the hand. The graduations are in units of 20 feet, but by careful observation 10-foot readings can

be taken. The instrument can be used in conjunction with an odometer for figuring average gradients, the odometer giving the distance and the aneroid the elevation.

The instrument is $3\frac{3}{4}$ inches in diameter and $\frac{7}{8}$ inch deep and weighs 10

ounces; it is made to withstand the vibration of the car. The price of the instrument is \$20.

For higher altitudes the scales may be had reading to 6,000 feet at the same price, 12,000 feet for \$1.70 extra, and 16,000 feet for \$3.30 extra.

GASKETS FOR EVERY JOINT ON THE MOTOR

Ranging from Spark Plug Size to Single-piece Four-cylinder Head Type

McKim

The McCord Mfg. Co., Detroit, produces both McKim copper-asbestos gaskets, in which the asbestos is completely enclosed by copper sheet and the French pattern, in which the outer edge of the asbestos filling is left exposed. Dies are on hand for making all sizes of round and flange gaskets, cylinder head gaskets, special gaskets for special motors, and so on. The McKim copper-asbestos round gaskets, made in sizes from 1 inch to $3\frac{9}{16}$ inches inside diameter, list per thousand as follows: 1-inch, \$17.90; $1\frac{1}{2}$ -inch, \$22.45; 2-inch, \$26.30; $2\frac{1}{2}$ -inch, \$30.40; the sizes vary by 32nds. French gaskets, same sizes, \$19.35; \$29.20, \$34.65, \$44.55. Flange gaskets, per hundred, \$7.10, \$9.50, \$13 and \$15.70. Intermediate sizes in proportion. Spark plug gaskets are made in both McKim and French types and in all sizes; prices, McKim, from \$11.50 to \$13.20 per thousand; French pattern, from \$11.50 to \$15.65.

Victor

In addition to manufacturing gaskets in quantities for motor and car builders, the Victor Mfg. & Gasket Co., Chicago, packs gaskets in assortments for special purposes. Ford gaskets are sold in sets. These are packed in boxes which contain from 12 to 100 sets of all except the cylinder head gaskets, which are large, each gasket covering the four cylinder heads. A box of 12 sets, containing 120 pieces, costs \$3.20; 25 sets, 250 pieces, \$6; 50 sets, 500 pieces, \$11.20; 100 sets, 1,000 pieces, \$22. Cylinder gaskets are \$75 per 100.

Complete sets of Ford gaskets, including head gaskets, are sold not boxed. Prices, 12 sets, \$11.60; 25 sets, \$23.72; 50 sets, \$46.60; 100 sets, \$91.40. Boxed, \$12, \$24, \$47.20 and \$92 for 12, 25, 50 and 100 sets. Head gaskets are put up separately in boxes of 12 at \$9.60; 25, \$19.40; 50, \$38; 100, \$76.

A box of Buick gaskets is another specialty. The box contains 300 gaskets of 20 different sizes that will fit all Buicks from 1905 up to date; price, \$10. Box of 200 assorted gaskets of the sizes required for general trade for use on cars of all makes, \$5. Assorted French type gaskets, open edges, 100 in a box, \$4.75.

The gaskets put up in these sets and

assortments are of the copper-asbestos and copper-brass-asbestos type. Other gaskets are made of solid copper, asbestos and other sheet packing; special gaskets for special exhaust pipe and other service where unusual forms are required; gaskets are made to specifications also, and in any quantities.

Indestructible

Gaskets, washers, disks, rings and stampings of every description are the product of the U. S. Indestructible Gasket Co., New York. The standard type of gasket manufactured for the motor car trade is the copper-asbestos and copper-brass-asbestos, though gaskets are made of paper, fiber, sheet asbestos and other packing materials.

A special gasket for spark plugs is made of asbestos-base packing with a heavy copper binding on the inner edge; the copper holds pressure and protects the asbestos, which is left bare to pack under the pressure and make a close joint without excessive pressure on the porcelain. The packing used in these gaskets is called Sparkite, and is sold in sheets at 70 cents per pound.

Round copper-asbestos gaskets are made in all sizes; an idea of the prices may be gained from the following examples: 1-inch diameter, \$10 per thousand; 2-inch, \$19.60; 3-inch, \$30.40; 4-inch, \$62. Oval gaskets in the same sizes, per 100, \$3.40, \$6.40, \$10.40 and \$15.40. Intermediate sizes run in 8ths and 16ths. These are only a few of the many kinds and sizes made, the company's facilities covering the whole gasket field.

Gasket Supply Co.

All sizes and styles of asbestos-filled copper gaskets are manufactured by the Gasket Supply Co., Philadelphia; both the closed and the open-edged or French type are produced. Gaskets are made in any quantities and special shapes are made to order. The list prices on closed type copper-asbestos gaskets are exemplified by the following: 1-inch, \$6.20 per thousand; $1\frac{1}{4}$ -inch, \$10.80; 2-inch, \$12.80; $2\frac{1}{2}$ -inch, \$15.80; 3-inch, \$19. The same sizes in French or open-edge pattern list at \$9.20, \$14, \$16.50, \$21 and \$35.60 per thousand. This company also manufactures large quantities of shims which, however, usually are made to

order owing to the varied requirements of different users.

Mach & Rebele, Inc.

Mach & Rebele, Inc., New York, manufactures everything ordinarily included in the gasket line, from all the materials used for packing. The chief product, however, is the copper-asbestos type of gasket, and these are made round, oval or flange type and in cylinder head form for motor car work. The standard or closed type, round, is made in sizes from 1 inch to $3\frac{1}{2}$ inches inside diameter, varying by 16ths; as an indication of the run of prices, the 1-inch size costs \$10 per thousand; $1\frac{1}{2}$ -inch, \$17.20; 2-inch, \$19.60; $2\frac{1}{2}$ -inch, \$25.20; 3-inch, \$30.40, and $3\frac{1}{2}$ -inch, \$47.20. Round gaskets of the French type, in which the outer edges are open, list at \$14.80, \$22.40, \$26.40, \$33.60, \$40.80 and \$48 per thousand in the same sizes. They are made both smaller and larger, however, the smallest sizes being $\frac{7}{8}$ and $15/16$ and the larger sizes running up to $4\frac{1}{4}$ inches inside diameter. Flange type gaskets for intake and exhaust manifolds range from $\frac{7}{8}$ to 4 inches inside diameter; the prices per hundred for the even sizes mentioned are \$3.40, \$4.40, \$6.40, \$9.60, \$10.40 and \$13.20.

Phoenix

Copper-asbestos gaskets with open or French edges, closed-edge patterns, exhaust and intake manifold, spark plug and cylinder gaskets, as well as fiber, sheet asbestos and other non-metallic gaskets are produced in quantities by the Phoenix Specialty Mfg. Co., Inc., New York. Round gaskets are made in sizes from 1 inch to 3 inches inside diameter in what the makers call their Never-Leak type, the sizes varying by eighths. Some of the sizes and prices are as follows: 1-inch, \$21 per thousand; $1\frac{1}{2}$ -inch, \$45; 2-inch, \$60; $2\frac{1}{2}$ -inch, \$72. Exhaust and intake manifold gaskets, 1-inch inside diameter, per hundred, \$15; $1\frac{1}{2}$, \$18; 2-inch, \$19.50; $2\frac{1}{2}$ -inch, \$21; 3-inch, \$25.

Herz

A large stock of French gaskets is carried by Herz & Co., New York, from 150,000 to 200,000 being kept on hand for immediate delivery. The sizes range from 1 inch to 4 inches inside diameter, increasing by 32nds. These are of copper-asbestos construction. The usual rim width is $\frac{1}{8}$ inch, though in the larger sizes the rim is wider. Flange gaskets for intake and exhaust manifolds also are carried, as well as cylinder head and other gaskets of irregular shapes.

In an advertisement of the Rajah Auto Supply Co., Bloomfield, N. J., which appeared on page 66 of the February 3 issue of Motor World, the price of the Rajah giant plug was incorrectly given as \$1.25 prepaid. This should have been \$1.50.

The tires received are then entered from the stubs and bills on typewritten lists, being grouped on the lists according to the size and make. Separate lists are made for firsts and seconds.

When a sale is made the proper sales slip—either cash or charge—is made out by the stock clerk and sent with the tag, which must be removed from the tire, to the bookkeeper. That tag is then attached, with a fastener, to the stub which has been on file in the bookkeeper's office, and finally the list is corrected by drawing a light line through the tire sold and writing in after its description, the date of sale and name of purchaser. This list shows at a glance just what number of tires, firsts and seconds, of each size should be on hand. Larsen gives his personal attention to the tire department and checks up the number actually on hand each week. This verified list is used for ordering

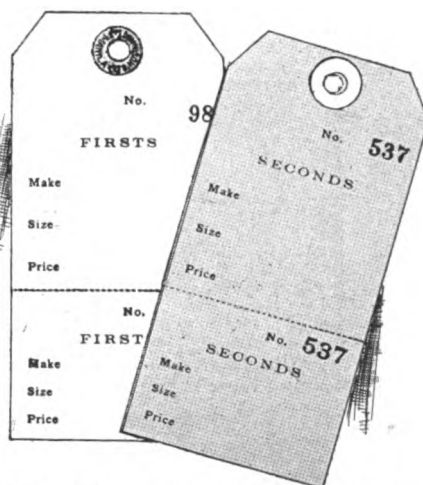


Fig. 4—When a tire goes into stock the tag is tied to it; the stub is kept by the bookkeeper. When a tire is sold the tag goes to the bookkeeper, who records the purchase and date

additional tires. As nearly as possible, Larsen states, he tries to keep his stock

of tires down to the probable demands so that the possibility of loss may be decreased and also to prevent the company from tying up an unnecessary amount of money in that class of stock. In determining the size of his orders, Larsen brings into play his knowledge of seasonal requirements, which he considers the best means of determining the quantity of stock that should be kept on hand.

Larsen is a thorough believer in system, but he also believes that it should be limited to what is actually needed to meet the requirements instead of being allowed to grow to an extent where it will hamper business and eat into the profits. His theory of system has been carried out in all departments of his organization and he has just enough of it to enable him to keep a thorough check on his stock. The result is high efficiency and low maintenance expense.

Two Letters That Help to Keep Service Stations Busy

Wide-Awake Repairmen Take Steps to Avoid Spring Rush and Keep Busy NOW

GEORGE H. BIRD
PRES. AND MGR.

BERNARD A. SYKES
VICE PRES. AND MGR.

BIRD-SYKES COMPANY
SINGLE BEST DISTRIBUTORS OF
AUTOMOBILES
2210-2212 MICHIGAN AVENUE
CHICAGO January Eleventh
1915

LOZIER
FAIRBANKS

TELEPHONE
CALCULATED 4546

Dear Sir:--

As our shop is small for the number of cars we have sold in this territory and we do not want the re-occurrence of last year's congestion in our Service Department, due to the fact that every one waited until Spring to have their overhauling done, we are taking the liberty of making this suggestion to you:

Let us go out and get your car and bring it to our shop and we will inspect and look over the entire car and submit to you an itemized estimate of material and labor necessary to put your car in shape for another season's running.

The labor incurred in going after, making estimate and returning same to you will cost you nothing. By doing this we think we can get the largest part of the Spring work in during the winter months and enable us to give you prompt and good service during the Spring "rush."

We trust you will appreciate we are doing this with an idea of giving our customers better service and that the above way is the only possible way that we can solve our difficulty, as we cannot secure larger quarters until our lease expires - a year from now.

You would feel justly hurt if you brought your car to us any time between the first of March and the first of July to have a thorough overhauling done and we were not in position to take it into our shop. Forseeing this condition as a probability we solicit your work now, so we can give it our undivided attention and assuring you we will use the best of material and workmanship, we remain

Yours very truly,
BIRD-SYKES COMPANY
J. H. Fowler
Mgr. Service Department.

FLP-M

Now is the time to go out after the repair and overhauling business that will keep your shop busy for the next month when things ordinarily are slack. Here are two letters which have come to MOTOR WORLD within the past few weeks, either of which might be used as a model by any Wide-Awake Repairman in any city for a letter to his particular list of customers

GENERAL MACHINE WORK

PHONE 4872 COLUMBUS

RICHARD B. LAFFAY
WIDE-AWAKE AUTOMOBILE REPAIRING
217-219 W. 64TH ST.
NEAR ASTORMAN AVE.
NEW YORK

FORMERLY FOREMAN OF REPAIRS
RICHARD MOTOR CAR CO.

ALL WORK FULLY
GUARANTEED

January 28th, 1915.

Dear Sir:--

I am confident that you have always found my automobile repair service such that when you are placing your order for spring work you will again favor me with a continuance of your valued patronage.

I am therefore writing to have you place any orders for contemplated work as soon as possible, for the purpose of avoiding the spring rush which usually sets in about the middle of March.

In view of the exceptional conditions due to the war, I anticipate a greater volume of repairs than ever before, and in consequence I have organized a splendid corps of mechanics and taken direct charge of them myself. Tools and equipment have been prepared and I will be here in person to attend to your wants during all working hours.

In no Machine Shop in this city can be found the equal of my organization; in no shop is the standard of high-class work and efficiency surpassed; no where could men work under better conditions, and no where are better results obtained.

I would be pleased to receive a personal visit from you for the purpose of assuring you of the splendid efficiency of my present organization and increased facilities to render you continued satisfaction in all automobile repairs entrusted to my care.

Trusting that I will continue to enjoy the pleasure of serving you, and assuring you of my personal attention at all times, I remain

Very truly yours,
Richard B. Laffay

BRL-M

H. Ward Leonard Expires Suddenly

Manufacturer and Inventor
Stricken With Apoplexy

Achievements Had Won Fame
in Electrical World

H. Ward Leonard, founder of the electrical manufacturing company bearing his name and an electrical engineer whose inventions have been of world-wide importance to the motor car and many other industries, died suddenly of apoplexy Friday night, February 19, at the Hotel Astor, New York city, during an entertainment given by the American Institute of Electrical Engineers.

Mr. Leonard was 54 years old and up to the time of his death was active and seemingly in good health. He took a lively interest in the affairs of the Ward Leonard Electric Co., acting in the capacity of consulting engineer. His chief activities during the last few years have been concerned with his patent business. More than 100 inventions in actual use are accredited to him, covering a broad field represented by electric lighting systems for motor cars and railroad trains, electric distributing systems, electrically-driven reversible rolling mills, electric mine hoists, locomotives, elevators, gasoline-electric drives, motor car transmission gearing and various automatic control features.

Between the years 1898 and 1900 Mr. Leonard was a manufacturer of motor cars, having become interested in this industry during a visit to France in 1905. He brought back to this country several foreign motors and incorporated them in cars of his own manufacture. Owing to difficulties in obtaining materials at his Bronxville, N. Y., plant, this was abandoned, but Mr. Leonard has never ceased to be keenly interested in the development of the automobile industry. The Ward Leonard system of battery charging and regulation, in which the basic idea has been to maintain a constant amperage, has been of special importance.

Mr. Leonard came into prominence as an electrical engineer at the age of 23, a year after his graduation from the Massachusetts Institute of Technology, when he was made a member of Mr. Edison's staff of four engineers engaged in the work of introducing the Edison central station system. At 26 he was made general superintendent of the Western Electric Light Co. of Chicago. In 1889 Mr. Leonard became general manager of the combined Edison interests for the United States and Canada. In 1891 the Ward Leonard company in Bronxville was founded.



H. Ward Leonard

For his work Mr. Leonard has been awarded prizes by the Franklin Institute of Philadelphia in 1903, the Gold Medal at the Paris Exposition in 1900 and the St. Louis Exposition in 1904. He was at one time president of the Inventors' Guild.

Mr. Leonard, in spite of many activities, found considerable enjoyment in his home and social life. He has been vice-president and also a manager of the American Institute of Electrical Engineers, and he was also a member of several social organizations, including the Union League Club of New York, the Inventors' League, the Engineers Club, the Clove Valley Rod and Gun Club, the New York Electrical Society, Technology Club of New York, and the Scarsdale Golf Club. He was a director of the Mount Morris Bank of New York and has been president of Bronxville.

The birthplace of Mr. Leonard was Cincinnati, O., and the date of his birth February 8, 1861. He is a descendant of John Alden, one of those who came to America in the Mayflower. Mr. Leonard's great-great-grandfather was one of the conspicuous figures just previous to the outbreak of the Revolutionary War. He was General Artemus Ward, commander-in-chief of the Massachusetts forces, and when General Washington took supreme command General Ward was made second in command.

Mr. Leonard married Miss Carolyn Good, of New York city, in 1895. His wife was his constant companion during his hours of leisure, and it was their delight to make yearly visits to Camp Chippewa, their summer home at Pointe au Baril, Georgian Bay, Ontario, Canada, where they fished and hunted together and thoroughly enjoyed the primitive life.

Poertner Heads Motor Contest Assn.

At the third annual meeting of the Motor Dealers Contest Association, held February 17 in New York, William C. Poertner was reelected president of the

organization. The other officers to serve for 1915 are as follows: First vice-president, E. Lascaris; second vice-president, E. C. J. McShane; treasurer, J. C. Nichols, and secretary, Edward F. Korbel. The new board of directors consists of all of the above officers and the following: C. H. Larson, I. M. Upperpu, W. J. Morgan, Horace De Lisser, A. B. Cordner, S. S. Toback, George H. Robertson, James Carples, Charles Wells and David Beecroft.

Autocar Directors Reelected

At the annual meeting of the Autocar Co. last week, the former board of directors was reelected. W. W. Norton, who has been for several years superintendent of the factory, was elected a vice-president and will hold the position of production manager. The officers of the company who were reelected are D. S. Ludlum, president; J. S. Clarke, vice-president; L. S. Clarke, vice-president; E. A. Fitts, secretary and treasurer, and F. C. Lewin, assistant secretary and treasurer.

Grus Heads Spring Oiler Company

The Grus Spring Leaf Oiler Co., Chicago, has been incorporated with a capital stock of \$25,000 and will produce leaf spring oilers under patents which have just been issued. Wm. Grus, Jr., is president of the company, the other officers being: Vice-president, A. J. Kasper, Jr.; secretary, G. W. Kasper; treasurer, C. K. Grus. These, together with E. M. Grus and F. P. Kasper, form the board of directors. Offices are located at 5213 Wayne avenue.

Shaw Heads Grant Motor Co.

David A. Shaw was elected president of the Grant Motor Co., Findlay, O., at the annual meeting of the company held last week. Other officers elected were: Vice-presidents, Geo. D. Grant and Geo. S. Salzman; secretary and sales manager, Geo. S. Waite. These men, together with Chas. A. Grant, Roger R. Hall, A. E. Dorsey and J. M. Howe, form the board of directors.

Eisemann Adds to Representatives

The Eisemann Magneto Co., Brooklyn, has added the following to its list of representatives: Montana Auto & Machine Co., Billings, Mont.; Pegram Motor Car Co., Atlanta, Ga.; C. Per Lee Noxon, Syracuse, N. Y.; McFarland Auto Co., Denver, Col.

Zimmerschied Standards' Head

K. W. Zimmerschied, chief metallurgist of the General Motors Co., has been elected chairman of the Standards Committee of the Society of Automobile Engineers. He succeeds Henry Souther, who resigned at the last winter session in order to devote himself to the Ferro organization, of which he is a member.

Dealer Supply House

The RETAIL NEWS

Garage Repair Shop

Hawkins-Twitchell Co. has been formed in Spokane, Wash., by Harry Twitchell and E. G. Hawkins, who resigned the presidency of the Hawkins Motor Car Co. to join the new enterprise. The company has located salesrooms and a service station at 122 South Walnut street and is handling the Hudson and the Federal truck. The Hawkins company hereafter will be under the management of M. D. Hawkins; it retains the Baker electric agency and its location at W1130 Sprague avenue.

W. H. Barnes & Son, distributor of G. M. C. trucks on the Pacific Coast, is putting up a \$40,000, two-story concrete garage on 8th avenue between Pike and Pine streets, Seattle. There are no elevators, the basement and second floors being reached by sloping runways. Each floor contains 14,400 square feet, a total of 43,200 square feet in the entire building.

Jungclas Automobile Co., Cincinnati, Southern Ohio distributor of the Overland, has secured a new salesroom at 8th and Race streets. A unique idea has been worked out. With 1,000 square feet of plate glass, semi-direct lighting and 200 high-powered window border lights, the salesroom resembles a big showcase and makes a pretty display of the Overland.

The Shafer-Decker Co., Rochester, N. Y., has taken over the premises of the Empire State General Vehicle Co. at 13 Circle street; increased business is planned in the new quarters; the company is a car dealer. The Empire State company is now purely a sales organization, handling gasoline and electric cars and accessories.

John D. Westbrook, Inc., which handles the Republic tire in Norfolk, Va., has moved into new quarters at 331 Granby street. W. L. Stevenson is in charge of the sales department and S. J. McKenzie, from the Republic plant, is in charge of the vulcanizing and repair department.

E. A. Sutherland, Roberts, Wis., has sold his garage and implement business, including the Ford agency, to Ben and Arthur Templeman, who will continue the business as Templeman Bros. Sutherland will open a garage in Hudson, Wis., April 1, handling the Ford in Hudson and vicinity.

The Louisiana Garage Co., Inc., has been formed in Shreveport, La., by W. M. Henry, J. B. McCook, J. T. Allison, R. A. Crain and R. E. Allison. Henry is president; J. T. Allison, vice-president, and McCook, secretary-treasurer. The capitalization is \$20,000.

Patton Fleming & Co., 2039 Ransted street, Philadelphia, manufacturers' representative, has been commissioned by the Electric Storage Battery Co., manufacturer of the Exide battery, to act

as distributor and battery service depot in that section.

The H. C. Skinner Co. has entered the trade in Portland, Ore., at 58-60 33rd street, as distributor of the Maxwell in Oregon and six southern counties of the State of Washington. Thirty subdealers have already been established.

The Toledo Central Garage, Toledo, has leased for 10 years a four-story and basement structure at 232 Huron street. It will be remodeled and fitted out as an up-to-date day and night garage, having accommodations for 300 cars.

The A. J. Monday Co., Milwaukee, has established a trimming, upholstering and top making department. The company operates one of the largest body-building, painting, enameling and general repair-shops in the Middle West.

R. C. Wescott, Columbus, O., dealer in the Regal from 1909 to 1912, has re-entered the field again as a Regal dealer. He has leased a building at 235-239 North 4th street and will open his salesrooms about March 1.

Bruce Lowry has opened a painting and overhauling shop in Columbus, O., at 321-23 North Front street, under the style Lowry & Green. He formerly was in charge of the Peerless Motor Car Co.'s and the Columbus Buggy Co.'s paint departments.

The Electrical Shop has been established in Racine, Wis., by William Pratt, Kerner Brandeis and Fulton Thompson. The corporation is capitalized at \$5,000 and will make a specialty of repairs on electrical devices.

Ralph De Witt, Columbus Savings & Trust building, Columbus, O., has been appointed distributor for the Midgley Tire & Rubber Co., Lancaster, O. He has several counties as territory for the Midgley tire.

W. F. Etscheid and Elmo Hibbard, Reeseville, Wis., have leased the garage and repair-shop of Herman Schiffer and will continue the business with Hibbard as manager. A car agency will be secured.

John W. Bowman, who handled the Stevens-Duryea in Boston for several years, has taken the Maxwell distribution. Bowman will continue at his present salesrooms on Massachusetts avenue.

The Winders Motor Sales Co. will sell the Chevrolet in Columbus and Franklin county. J. P. Adamson has recently been appointed sales manager of the Winders company which also handles the Velie.

The Adams-Oakland Co., Cleveland distributor of the Oakland, has leased property at 3122 Euclid avenue and will erect a two-story salesroom and garage; it will be ready in May.

H. B. Crosier, Jackson, Mich., has taken the agency in Jackson and Eaton counties for the new Hollier eight, made

by the Lewis Spring & Axle Co., of Jackson.

H. F. Scruby has entered business as the Universal Service Co. at 1716-18 Broadway, Seattle; the firm will conduct an exclusive Ford service and accessory station.

Thos. J. Hay, Hupmobile and Chandler dealer in Chicago, has moved to 2519 and 2521 Michigan boulevard. The floor space of the new building is 30,000 square feet.

The Brasher Motor Car Co., Columbus, O., has opened new quarters at 4th and Gay streets; the company has secured the White distribution in Central Ohio.

Brown & Davis, East 13th street, Cleveland, have secured the Allen agency; they formerly were connected with the Detroit Sales Co. in that city.

The International Harvester Co. has opened a new show room for the sale of motor trucks in Columbus, O.; it is located at 470 North Park street.

S. H. Stoneburner, Tiffin, O., has purchased a half interest in the Sawyer Motor Co.; the name has been changed to Upper Sandusky Overland Co.

The Kelly-Springfield Tire Co., San Francisco, has moved into new quarters at 1147 Van Ness avenue. A service department has been added.

The Tacoma Avenue Repair Co., 1020 Tacoma avenue, Tacoma, Wash., has been taken over by Don Modrall; he will continue the business.

The Lancia and Sheffield Simplex salesrooms have been moved to larger quarters on 59th street, just east of Broadway, New York.

Elmer Grady and J. B. Harris, Washington, D. C., have opened an office at 1620 L street northwest and will distribute the Quaker tire.

Herman L. Freudenburg, Vallejo, Cal., has sold his interest in the Star Garage to his partners, W. J. Kennedy and Theodore Rump.

L. J. Snyder will soon start the erection of a garage on South Market street, Galion, O., to be occupied by Green & Snyder.

The Hodgins-Fosdick Co., Spokane, Wash., has secured the Haynes distributing agency for the Inland Empire.

Comly S. Nagle, Pottstown, Pa., has purchased the garage of Paul Dunlop at 115 High street; he will operate it.

George C. Snyder, Greenville, Mich., until recently with the Belknap Lumber Co., plans to open salesrooms.

G. M. Mitchell & Son, Stoneville, N. C., plan to open a garage; it will be managed by J. N. Kallam.

Merve Jacka, who intends also to handle cars, will open a repair-shop in Crystal Falls, Mich.

JOHNSTON AGAIN HEADS NEW YORK DEALERS' ASS'N

R. H. Johnston was unanimously re-elected president of the Automobile Dealers' Association of New York City at a meeting of the board of directors last week. He is manager of the White Co.'s metropolitan branch.

C. H. Larson, Cutting Larson Co., was reelected vice-president, and Charles M. Brown, manager of the Winton Motor Car Co.'s branch, was made secretary and treasurer to succeed Frank Eveland, who resigned following the retirement of his company, A. G. Spalding & Bros., from the motor car trade.

The 50-foot rule, which forbids the location of a garage within that distance of churches, theaters and other public assembly buildings, was discussed and President Johnston reported on the association's opposition to the statute. The organization went on record as favoring some relief from the multi-inspection regime in the metropolis, and discussed the Lockwood bill, whereby the New York legislature would concentrate inspection powers.

Peoria Dealers Band Together

The Automobile and Accessory Dealers' Association, Peoria, was organized at a meeting held last week, following the show. A banquet preceded the business meeting. The board of directors includes H. B. Pinkerton, C. E. Lyall, R. F. Graham, H. B. Russ, H. L. Tauzer, George Cummings, F. J. Sellard, J. H. Woody, and F. C. Vaughan. The directorate will elect officers later. A report by R. F. Graham, treasurer of the show, stated that \$1,600 was received from space rental and \$1,400 from admissions. After all expenses were paid the dealers were given a 70 per cent rebate on rentals. A feature of the evening was an address by P. L. Henderson, of Chicago, who discussed "Co-operation." Alec Moody, of Chicago, also appeared on the program.

Dort Dealers Convene in Flint

Presided over by general sales manager John D. Mansfield, of the Dort Motor Car Co., about twenty-five district sales managers and big dealers of that new company, held their first convention in Flint last week. Among the various subjects which were discussed was the condition of the automobile business in the United States, the outlook in the various states, dealers selling campaigns and establishment of service stations.

Johns-Manville Men Get Together

A convention of all the salesmen, traveling men and department managers of the automobile department of the H. W. Johns-Manville Co., located in the lower peninsula of the state of Michigan, was held at the headquarters of the company

in Detroit last week. The general conditions of the trade, and more especially those lines handled by the company, were discussed. The meetings, in which about 45 men of the sales organization took part, were presided over by Edward A. Cassidy, general manager.

Takes Buyers to Studebaker Factory.

So keen is competition in Waterville, Wash., that Henry J. Laymance, Studebaker dealer, offers to any club of five purchasers a free trip to the Studebaker factory in Detroit; this, of course, furnishes an opportunity for seeing the city as well. Laymance states that this cuts his commissions in half but that he still makes a profit. Said he: "We have to do something to wake them up."

900 at Massachusetts Operators' Ball

The fifth annual ball of the Massachusetts Automobile Operators Association was held last week at Horticultural Hall, Boston, and it was attended by about 900 men and women. Governor Walsh and Mayors Curley of Boston and Good of Cambridge were represented by members of their staffs, and all the motor organizations sent representatives.

Allen Visits Pacific Coast

C. Louis Allen, general sales manager of the Pyrene Mfg. Co., New York, left last week for a six weeks' tour of the Pacific Coast. He will reach San Francisco a few days before the opening of the exposition.

Du Puy Pennsylvania's Head

At the annual meeting of the directors and stockholders of the Pennsylvania Rubber Co., Jeannette, Pa., the following officers were elected: Chairman of the board, Herbert Du Puy; president-treasurer, H. W. Du Puy; vice-president, C. M. Du Puy; general manager, S. G. Lewis; secretary, G. W. Shiveley, and assistant treasurer, C. G. Morrill.

Compensation Law Amendment

An amendment to the workmen's compensation law, allowing an employer in New York state to settle an award with an injured workman, was passed by the Senate at Albany. The bill now goes to the Assembly.

By the terms of the direct settlement clause, employers and employees may settle their cases without interference on the part of the compensation commission if the workman is satisfied. If he is dissatisfied, he may appeal an injury case to the commission after 24 days. Sixty days after death his family may appeal if they do not like the settlement offered.

Gas Down 1/2 Cent in Kansas City

Kansas City, Mo., Feb. 22—The price of gasoline has been reduced one-half cent a gallon, the new figure being 9.8.

PACKARD DEALERS DISCUSS CONDITION OF CAR TRADE

Several of the largest Packard distributors in the country took part in a business session at the Packard Motor Car Co.'s plant in Detroit February 15. The condition of the trade in those sections of the country where the dealers came from was discussed. Those who attended were:

H. M. Allison, Chicago; I. L. Beck, Pittsburgh; M. J. Budlong, New York; C. A. Foster, Cleveland; Alvan T. Fuller, Boston; E. B. Jackson, Philadelphia; C. P. Joy, St. Paul; W. J. Parrish, Kansas City, and J. W. Tarbill, Cincinnati. Sales Manager H. H. Hills presided and Alvan Macauley, vice-president and general manager, and Henry B. Joy, president of the company, took part in the discussions.

Philadelphia Discusses the Bus

The plan to enfranchise a motor bus line in Philadelphia has been the subject of discussion for more than a year, although it was not until late last fall that the first definite action was taken. At that time an ordinance was introduced in the Council requesting a franchise for the operation by the United Traction Improvement Co. of motor buses similar in construction to those operated on 5th avenue, New York. The petition, signed by Victor H. Conkle, secretary of the company, represents that the company would start 12 months after the granting of the franchise, and, if possible, would agree to a proposition that would permit a transfer privilege.

The type of bus, to be operated is a double decker, with a seating capacity of 48, weighing approximately 10,500 pounds. Motive power is to be electricity generated by a gasoline motor.

Waldon Leaves Packard for Cadillac

Sidney D. Waldon, vice-president in charge of forework and current engineering of the Packard Motor Car Co., has severed his connection with that company to join the Cadillac Motor Car Co., where his duties largely will be of an advisory nature in the engineering department; also, he will assist the management in a general way. Jesse G. Vincent, chief engineer of the Packard company, has been appointed vice-president for engineering to succeed Waldon. Associated with the Packard organization practically since its inception, having joined it in 1902, when the concern was still in Warren, O., Waldon advanced from almost the bottom of the ladder to sales manager, general manager and vice-president in turn. He is today one of the big figures in the industry. Vincent went to the Packard company in 1912, having previously been associated with the engineering work of the Hudson Motor Car Co.



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Showroom Attitudes

AT the Kansas City show a salesman who was endeavoring to answer the questions asked by a man and his wife, who were real prospects, persisted in placing himself right up against the center of the car, while both the man and the woman stood back in their endeavor to get a general view of the body and to see how its various curves and straight lines appealed to them. But the salesman entirely failed to see that his body was an actual hindrance to the sale; he actually failed to interpret the mental attitude of the buyer; in a word he was not following out the natural line of selling.

What this salesman did many others do. Give your prospect a chance to look at the car, and if ever a prospect moves away from the side of the body to get a better look at it be sure that you get out of the way, and if a chair or any other obstacle stands in the way of the proper showing of the body get it out of the way as quickly as possible.

Slovenly Manners

Nothing is more distracting to a sale than to see a salesman walk around with his hands in his pockets and lean upon the side of the car placing one foot on the runningboard. Stand off ten or twenty feet and get a look at the angles of that salesman and you will readily see that he is positively destroying the general appearance and lines of the car.

In the first place a salesman should be physically strong enough to stand erect on two legs at the same time, and if he cannot do this he had better get a chair. Don't stand with twisted legs and arm draped around a pillar or over a windshield.

What would your salesroom look like if the pillars were not straight; picture the wall of the salesroom with the pictures not hanging straight; what is the floor like when the rugs are turned up at the corners; and then ask yourself what this salesroom looks like with the salesman standing on one leg, with his head over on one shoulder and with one hand in his pocket and the other hanging onto the bow of the top or onto the radiator cap or side of the windshield.

Increasing the Handicap

ONE New York motor car salesroom has small plate glass windows with a heavy square brick pillar between adjacent plates of glass, the result being that when you walk along the sidewalk, or ride past on top of a bus you cannot get a complete view of any one car. You see the radiator through one window and the tonneau through the next, with the middle hidden by the brick pillar. The situation could be improved by not placing the car so close to the windows. Very frequently cars are placed too close to the windows.

If your windows are small then place the car further back on the salesroom floor. Perhaps this is not possible; then instead of attempting to display the car with the side to the window place it in a three-quarter front position; and if you should have two models and two small windows you could place one three-quarter front and the other three-quarter rear.

After you have placed the car in the desired position, go on to the sidewalk, walk past both ways and see if you can get a good general view of the car as you have placed it. This done, drive past both ways in your car and note the results. In each case ask yourself the question, "Can I see the car as it should be seen to make an impression on a customer?" If not, change it so you can.

Wall Decorations

WHY not make salesroom decorations arguments that will help in closing a sale. Good photographs or photographic enlargements will greatly aid in doing this. The selection of photographs depends largely on the car you sell. Life-size photographs of the president or sales manager of your company will rarely do much to assist in closing a sale. Pictures of trophies may aid if you sell a sporty type and wish to appeal largely to that class, but these are generally out of place where you are selling to home people.

Covering the wall with pictures of your various models without passengers is not nearly so effective as having passengers in them. Racing photographs are all right if they appeal to your clientele. Factory photographs are rarely impressive; they are not generally credited at 100 per cent. Men have for years been accustomed to seeing bird's-eye views of plants that you cannot harmonize with the plant when you visit it. The proper place for such business photographs is in the private office, not the show room.

BEARING EMBARGO RUMOR CAUSES SOME UNEASINESS

**Reported That Germany Has Prohibited
Exportation as War Measure—Affects
Only Larger Sizes—Not Likely to
Last—Dealers Well Stocked**

It is reported that Germany has placed a total embargo on the exportation of ball bearings. If this be true, that this will seriously effect the business of importers in this country is the opinion of the majority of those engaged in this business. It is stated by several that considerable difficulty is had even at the present time in securing bearings of certain sizes from the countries at war. These are generally the larger bearings, and according to one importer, notably in the sizes having an internal bore of $\frac{3}{4}$ or $1\frac{1}{2}$ inch. With this situation, and considering the probable effect of the embargo, it is certain that American makers or those dealing in bearings imported from other nations will secure increased business.

According to the Barthel & Daly Co., the embargo is not likely to last long enough to seriously affect the stock of those who have prepared themselves for a shortage. The J. S. Bretz Co. states that it has heard nothing of such an embargo. Marburg Bros. is of the opinion that such an embargo would seriously affect the companies that are importing from the affected area with, of course, a corresponding rise in the business of those securing their bearings in America or unaffected countries.

The Norma company states that the larger bearings are scarce, but that no trouble, relatively speaking, has been had in bringing the smaller bearings into this country. According to this company, there is little doubt but that Germany will continue to allow the exportation of small bearings.

The Riebe company states that while certain sizes are missing it is because the manufacturer has not been able to secure the raw material from the German mills because this material has been used for purposes other than the manufacture of bearings. This situation, it is expected, will be shortly relieved by supplies from the mills which will furnish their regular customers with chrome-nickel steel.

The S. K. F. company states that there seems to be a shortage in the $\frac{3}{4}$ - and $1\frac{1}{2}$ -inch internal bore bearings.

The Rhineland Machine Works, which received a cablegram from Germany to the effect that this embargo had been declared, is of the opinion that no more ball bearings will be exported from that country, with the effect that German dealers here will be troubled by a shortage and the extra demand on the domestic makers will cause a rise in price. The Hess-Bright company has not as yet heard of the embargo, but owing to a large stock added to the bearings that are made in America, does not believe that the consequences will be serious.

Keep Watch for This Man

J. Wilson White, alias Harry Paige, is wanted in Duluth, Minn., on grand larceny charges, which followed his entry into the motor car trade in that city. He is said to have secured employment as a salesman and then to have victim-

ized certain persons. The published description of him says:

"He is very well versed in automobiles; claims to be a designing engineer, and is a fluent talker. Claims to have managed the sale of the White Co.'s cars in India. Has traveled considerably and talks with a strong English accent." If located, Chief of Police C. H. Troyer of Duluth requests that he be notified at once and states that he will be extradited from any state. In Duluth he was



J. Wilson White, alias Harry Paige

employed by the Mutual Auto Co. His description follows:

NAME—J. Wilson-White. ALIAS—Harry Paige. NATIONALITY—English. OCCUPATION—Automobile salesman and engineer. AGE—38 or 40. HEIGHT—About 5 feet 11 inches or 6 feet. WEIGHT—About 165. COMPLEXION—Fair. FACE—Rather long face. EYES—Blue. EARS—Regular. HAIR—Dark brown. MUSTACHE—No. BEARD—No. NOSE—Prominent. LIPS—Large lips. BUILD—Slim. HOME—By him claimed to be Troy, N. Y. CLOTHING—Very good tailoring. He last wore blue serge. Good dresser. HAT—Brown felt or derby hat. SHIRT—Fine linen shirts. SWEATER—No. OVERCOAT—Blue (dark) chinchilla, yellow lining. SHOES—Ordinary with gray gaiters. JEWELRY—Wore Masonic ring. GLASSES—No. HABITS—Considered good. WALK—Ordinary. MOUTH—Ordinary. TEETH—Gold filled. SPEECH—Pronounced English. MARKS OR SCARS—Don't know of any.

Gray & Davis 1914 Sales \$4,000,000

The gross sales of Gray & Davis, Inc., for 1914 are understood to be \$4,000,000, a new high-water mark. The first six months registered sales of \$2,500,000, the final half year tapering off normally to around \$1,500,000. The earnings for the full year were in excess of \$300,000, over two-thirds of which was contributed in the six months to June 30. At this rate, earnings upon the preferred stock are equivalent to about six times the dividend requirements, the outstanding preferred having increased from \$500,000 to \$750,000 during the year

RECORD ATTENDANCE AT PEORIA DEALERS' SHOW

Attendance So Good Exhibitors Will Receive Rebate of 75%—To Become an Annual Function—All Dealers Report Spring Trade Greatly Stimulated

The Peoria (Ill.) show, which was held February 9-12, attracted 8,000 spectators, breaking all records and leaving a balance of \$1,200 after all bills were paid, permitting a rebate of 75 per cent upon space rentals. Sixty-five cars were exhibited, 15 dealers taking space. Twelve accessory exhibits were made. Dealers were enthusiastic over the unexpectedly large attendance and the interest shown. A number of sales were reported during the show and it is believed that the exhibit has greatly stimulated spring trade.

The Ingram Motor Co., Jeffery dealer, sold the first car at the show and in addition disposed of six others. The Peoria Motor Co., Mitchell dealer, sold two; Cadillac, four; Stearns, one; Bartholomew Co., three; Velie, two; Ford, six; Detroit electric, four; W. E. Johnson, Broc, Borland and Argo electric dealer, four.

Heretofore the shows have been staged about every two years, but the success of the 1915 event has warranted the staging of an exposition annually.

Reorganize Hartford Auto Parts

The Hartford Auto Parts Co., Hartford, Conn., has been reorganized insofar as the management of the company is concerned, the following officers having been elected: President, Cyrus C. Chamberlain, treasurer of the Blakeslee Forging Co., Southington; vice-president and treasurer, James M. Carney; secretary and assistant treasurer, Harry W. Bigelow. These men, together with Edward D. Redfield, president of the City Bank of Hartford, Horace N. Ensworth and John H. Trumbull, president of the Trumbull Electric Co., form the new board of directors. The company now has a large amount of business on hand and is operating day and night.

Lien Law for San Francisco Garages

The Garage Owners Protective Association of San Francisco is at present three years old, and during its life has been of considerable value to garage owners in that it has successfully prevented the passage of much legislation which would have been detrimental to the interests of its members. A credit rating bureau also is operated, and it is stated by Secretary A. D'Ettel that this has been the means of saving members much money. The association is at the present time concentrating its efforts to have a garage lien law passed.

SIX-CYLINDER TOURING LATEST STEWART MODEL

Has Continental Motor and Aluminum Body and Price is \$1,950—Built as 3-Passenger Roadster at Same Price

A six-cylinder car which is fitted with either 7-passenger touring or 3-passenger roadster body at the same price, \$1,950, is a brand new product of the Stewart Motor Corp., Buffalo, N. Y., which for several years has manufactured delivery cars. The new machine, like the commercial models, has a sloping hood of the Renault type, which adds not a little to the generally attractive appearance of the body. Complete equipment is supplied, including Westinghouse double-unit starting-lighting system, power-driven tire pump and tonneau heater.

The motor is a Continental with cylinders $3\frac{1}{2} \times 5$, which gives a S. A. E. rating of 29.4 horsepower, and is built as a unit with a 3-speed Brown-Lipe gearset; the clutch is of the dry-plate variety, the working surfaces being steel against Raybestos. Pistons and connecting rods are of light construction; the crankshaft is $2\frac{1}{4}$ inches in diameter and runs in three bearings. The camshaft is $1\frac{1}{4}$ inch and also has three bearings. The power plant can be removed from the car without disturbing any of the other units.

Lubricating oil is circulated by a plunger pump and is fed by force and splash, the main bearings getting their oil under pressure through copper leads. The carburetor is a Stromberg; ignition is effected by the Westinghouse unit, which also handles the starting and lighting.

The radiator is mounted in the cowl, where it is well protected from accidental damage and from the effects of vibration, and air is drawn through it by a

cooling system is similar to that which has given such satisfaction in the Stewart commercials.

Drive from the gearset to the rear axle is through a tubular propeller shaft having two Spicer universals. The rear axle is a full-floating Timken and the front axle also is a Timken; Timken roller bearings are used in the gearset. Final drive is through helical bevel gears.

The frame is of conventional design, $4\frac{1}{2}$ inches deep, without offset. Spring suspension at the rear is by cantilever springs which are hung on a large tube extending across the frame and projecting through the side members at each side. Front springs are semi-elliptics, and all are made from silico-manganese steel.

Wheels are of wood with $34 \times 4\frac{1}{2}$ tires on Firestone Q. D. demountable rim; rear tires are non-skids. The wheelbase is 127 inches and the tread standard, 56 inches.

Aluminum is employed in the construction of the body, and the mouldings are of the same light and rustless material. The rear seat is 47 inches wide and the front seat 45 inches wide, there being ample space for 7 passengers when the two disappearing auxiliary seats are in use.

New Four in Herff-Brooks Line

The Herff-Brooks Corp., Indianapolis, has announced a new small four, called the Herff-Brooks "25," which sells at \$765. The car will be made at the Richmond plant. It has a four-cylinder motor, developing 25 horsepower, the cylinders being block cast. A few other features are inclosed valves, unit power plant, with three-point support. Cooling water is gravity circulated through a tubular radiator. The Atwater Kent Unisparker ignition system is used. There are three speeds forward and one reverse. Left hand drive and center control are used. The car has a 106-inch wheelbase.

NEW SIX-CYLINDER DORRIS HAS VALVE-IN-HEAD MOTOR

Built Only for 7 Passengers and Sells for \$2,475—Power Plant is a Unit and Overhead Valves Are Enclosed

In adding a six-cylinder car to the Dorris line the Dorris Motor Car Co., St. Louis, Mo., has adhered quite closely to standard Dorris features of design, including unit power plant, multiple disk dry clutch, overhead valve mechanism with enclosed valves, and speedometer drive from the inside of the gearcase. The car is built as a seven-passenger touring, has a wheelbase of 128 inches, $36 \times 4\frac{1}{2}$ tires, complete equipment, including Westinghouse starting-lighting, and sells for \$2,475.

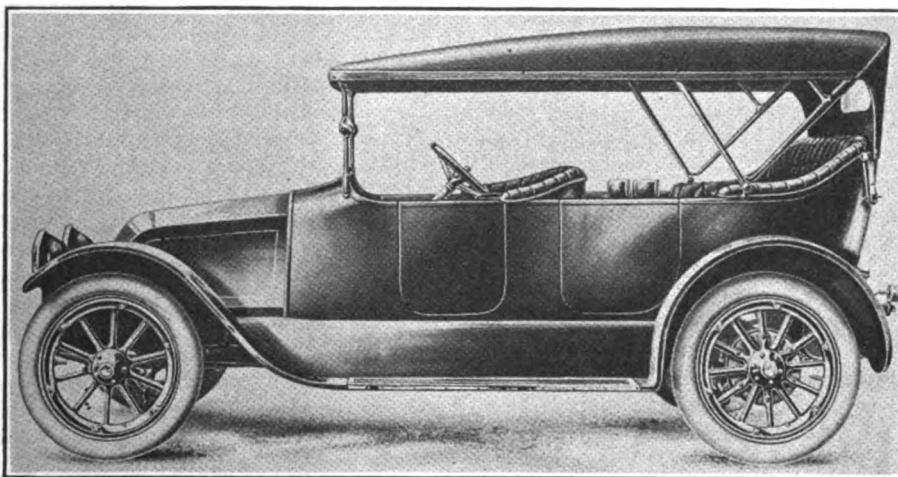
The cylinders are cast in threes and are 4×5 with valves in the heads operated through long push-rods and overhead gear; all the overhead parts are enclosed by a top housing of extremely neat design. A single camshaft with integral cams is employed. The crankshaft not only is unusually large, being $2\frac{1}{4}$ inches in diameter at the bearings, but it runs in seven bearings, so that each crank is supported on each side.

Lubrication is by constant level splash, the oil being circulated by a gear pump; a sight feed is mounted on the dash and an oil gauge on the crankcase. Cooling of the radiator is furthered by the fan-type flywheel, which exhausts the hot air from under the hood and draws in cool air through the radiator. The Westinghouse electrical system takes care of ignition as well as starting and lighting. The carburetor is a Stromberg with hot-water jacketed intake pipe.

The three-speed gearset is mounted as a unit with the motor, though there is no housing around the flywheel; the gear shafts run in Timken roller bearings, adjustable for wear. The dry-disk clutch is housed in the flywheel, and is sufficiently small to leave ample room for the fan spokes.

Drive from the gearset to the rear axle is through a propeller shaft with two universals completely enclosed and running in grease. The rear axle is a full-floating Timken with helical bevels and a differential that is removable through an opening at the rear of the housing; Timken roller bearings are used throughout the axle, as well as in the front axle, which is of the conventional I-beam design with the tie-rod of the steering gear behind it.

Conventional design is employed in the frame, which is $4\frac{1}{2}$ inches deep. The rear spring suspension consists of a three-point platform system with 50-inch



The new Stewart 7-passenger six has spiral bevel gear drive and a unit power plant that is easily removable. The body is of aluminum. A tonneau heater and power tire pump are features

side springs and a 40-inch cross spring; front springs are semi-elliptics 42 inches long. Front springs are $2\frac{1}{4}$ inches wide and rear springs $2\frac{1}{2}$ inches. The steering gear is a Gemmer worm and gear, adjustable.

Both brakes are on the rear hubs and are 14 inches in diameter by $2\frac{1}{2}$ -inch face; the service brake is contracting and the emergency brake expanding. Wheels are of wood, with $36 \times 4\frac{1}{2}$ tires, either Goodrich, Diamond or Firestone, mounted on Stanweld demountable detachable rims; rear tires are non-skids. The tread is the usual standard.

The seven-passenger body follows conventional modern lines; the standard finish is dark blue. Genuine leather is used for the upholstery, which is built on Rough Rider springs and tufted with ventilating buttons. Fenders are well crowned.

The equipment list is quite comprehensive, including an engine-driven tire pump, Golde one-man top with dust cover and side curtains, rain vision ventilating windshield, 60-mile Stewart speedometer with season odometer and adjustable trip mileage register, tire carriers at the rear, an extra demountable rim, 10-inch electric headlights of the double-bulb type, electric tail light with license carrier, electric inspection light, Klaxet horn, robe rail and foot rest, and the usual jack and tool outfit.

Asks Members for Reasons for Absence

When certain members of the Iowa Automobile Business Association, Des Moines, failed to attend the last meeting of that organization, Secretary N. T. Miller was directed to send a letter to each absentee asking him why he had not attended. The attendance of members is regarded as essential to the success of the organization.

Three new members were added, giving the organization a membership of more than two-thirds of the total trade in the city; a membership committee of five was named to aid in this work. A committee was appointed to draft a set of garage rules for employees, these to cover the handling of cars in the garage, making deliveries and similar matters.

The question of a state organization came up, but the committee which had been delegated to investigate this situation reported that it did not deem it advisable to proceed with such a movement until the Des Moines movement assumes proportions which make extension logical.

Exide Battery Declares Dividend

The directors of the Electric Storage Battery Co., Philadelphia, have declared a dividend of 1 per cent from the net earnings of the company on both common and preferred stocks, payable April 1, 1915, to stockholders of record at the close of business on March 22, 1915.

GRAPHIC RECORDS USEFUL TO MOTOR TRUCK USERS

New York Section of Motor Truck Club Hears Papers on Automatic Devices for Recording Data on Operation

The effects of self-recording instruments in increasing deliveries and decreasing repairs was the subject discussed at the monthly meeting of the New York section of the Motor Truck Club of America, held February 17 in the auditorium of the Automobile Club of America, New York. Three papers were submitted, one, by H. A. Long, general manager of the Service Recorder Co., Cleveland, which was read by V. E. B. Fuller, New York manager of the same company; the second, written by Gridley Adams, advertising manager of the Stewart-Warner Speedometer Corp., Chicago, was read by the club secretary, F. Nelson Carle; and the third was prepared and read by W. E. McGuirk, sales manager of the American Taximeter Co., New York.

None of the papers described the instruments made by the respective companies, but discussed their application and cited cases where their use had enabled owners to know just what their trucks were doing when out on long trips, to detect overspeeding, excessive loading and unloading times, loafing on the routes and to accurately check lunch periods.

Long defined the truck recording device as "some form of instrument which records time, mileage, speed, temperature, gasoline or oil consumption, or some combination of these, and which provides a permanent record in the form of a tape or chart." There are two types of such instruments, one, which is operated from the wheel through a flexible shaft, and the other, self-contained and having no connection with any moving part of the vehicle.

McGuirk touched briefly on the development of the taxicab and its recording device and stated that the taxicab business had been made possible only by the use of a reliable recording device. The fares are calculated from the cost of operation per mile as shown by the recording instrument. In a similar manner no truck operator can say positively just what his cost of operation is unless his vehicles are equipped with some sort of device which registers accurately the mileage covered each day by the machine on which it is installed.

This point was forcibly brought out in the paper of Gridley Adams, who cited an example showing the great variance of cost-per-ton-mile figures when the mileage was guessed at instead of being

determined from some type of reliable recording instrument. Little discussion followed the reading of the three papers.

Detroit Foundry Creditors Get 15%

At the first meeting creditors of the bankrupt Detroit Foundry & Mfg. Co., Detroit, it was decided to accept a cash settlement of \$4,000 for their claims, which will result in the distribution of a dividend of about 15 per cent. A first dividend of 5 per cent was ordered paid at once by referee in bankruptcy Lee E. Joslyn.

Stock of Machine Parts Changes Hands

The Service Gear & Machine Co., Reading, Pa., has purchased the entire stock of gears, shafts and patterns of the service department of the American Die & Tool Co., Reading. The former company will maintain a stock of transmission gears, spline shafts, countershafts, bevel differential gears and axle shafts for a great many obsolete cars. This stock will be carried in Reading and by the company's dealers throughout the country. J. D. Kaufman, formerly with the American company, will have charge, with headquarters in Reading. The American Die & Tool Co. hereafter will devote its energies to the production of transmissions, light car rear axles, gears and other parts for manufacturers only.

To Pass on Carburetor Damages

The statement made in the last issue of Motor World in the report of the decision in the Stromberg-Zenith patent suit to the effect that the former company can collect a royalty on the two models of Zenith carburetors which Judge Sanborn held were infringements is misleading to a certain extent. The Zenith company points out that the matter has been referred to a master, who will pass upon the question of damages which the Stromberg company may have sustained by reason of this infringement and that not until such damages shall have been ascertained can the Chicago concern collect.

Editor MOTOR WORLD:

We note in the publicity concerning the sale of the Willys interests in the Gramm Motor Truck Co. building his Utility car and the Garford company building Garford trucks, that the writer has been unintentionally mixed up in this, due to the local papers getting the matter wrong. The writer, who is interested in a small way as a stockholder in the old Gramm Motor Truck Co., of this city, which is in no way, shape or manner a part of any of the Willys holdings at the time he sold, and B. A. Gramm's line of trucks are built only and exclusively by the Gramm-Bernstein Co.

The Gramm-Bernstein Co.

B. A. Gramm,
Lima, O. Vice-Pres. and Gen'l Mgr.

PRACTICALLY ALL TIRES NOW HAVE BEEN LOWERED

**All Principal Makers Have Adjusted
Lists in Accordance With Recent
Movement—Additional
Statistics**

Practically all makers of tires have now readjusted their prices in accordance with the downward movement instituted about a month ago. Comparisons of the new and old list prices have been given in Motor World as they have been made, and this week there are presented the new and old lists of four principal sizes of those tires whose new figures had not previously been listed. In some cases February 1 is the date when the readjustment of prices went into effect.

Bloomington Show Well Patronized

The Bloomington Automobile show broke all records in relation to attendance, 4,150 paying twenty-five cents each to see the exhibit. The show lasted but three days this year, yet despite this, more people attended than during preceding years when the show ran four days. In addition, the dealers reported forty sales, twice as many as last year, while there appeared to be a greater number of prospects than ever before. From the interest displayed and the direct results already known, the dealers

believe that the show will prove to be the most advantageous to the trade in the history of the industry. This opinion was unanimous. There appears to be no lack of prosperity among the automobile buying class this year.

Engineers Discuss Eight-cylinder

The eight-cylinder motor was the chief topic of discussion at the meeting of the Indiana section of the Society of Automobile Engineers, held February 16 at the Claypool Hotel, Indianapolis, Ind. The principal speaker was J. O. Heinze, chief engineer of the Northway Motor & Mfg. Co. Other speakers on the same subject were George Dickson, of the National; Charles Crawford, of the Cole; Howard Marmon, of Nordyke & Marmon, and W. L. O'Neil, of the Stromberg Motor Devices Co. He referred especially to the carburetor problems that have been brought out prominently by the eight-cylinder engine. The meeting was presided over by Lon R. Smith.

London Man Seeks Agency

Guy Lewin, head of Guy Lewin, Ltd., London, England, arrived in New York February 16 on a business trip which will take him eventually to Detroit, where it is his purpose to make arrangements to take the agency for an American car selling for less than \$1,000. He will make his headquarters at the Hotel Statler. Prior to reaching Detroit he will remain a few days in Buffalo as the guest of George Houk of the Geo. W. Houk Co.

BRIDGEPORT DEALERS SELL 71 CARS AT ANNUAL SHOW

**Fifth Annual Event Most Successful of
Them All—Seventy Exhibitors Dis-
play Cars and Trucks and
15 Accessories**

Bridgeport's fifth annual show, the most successful in the city's history, came to a close Saturday evening, February 20, after a week's duration. The state armory, where the show has been held for the past three years, was a scene of gaiety during the week. More than 10,000 people passed through the gates, the average daily attendance being slightly over 1,500.

Seventy exhibitors had booths, 50 of which were utilized to display pleasure vehicles. Five different makes of trucks were exhibited and 15 firms displayed accessories, which were one of the features of the affair.

During the week 71 machines were sold. The following exhibitors made the sales: Harry M. Ford, Harry H. Ford, W. H. Starbuck, D. W. Flint, Arthur L. Clark, W. G. Minty, Consolidated Motor Car Co., George W. Wuestefeld, Elm Auto Co., Cadillac Agency, Blue Ribbon Garage, Detroit Electric Agency, Peck & Lines, John Pierce, Cowles & Tomlinson, Lyford & Ferris, West End Auto and Carriage Co. and the Trumbull Motor Car Co.

TIRE MAKERS WHO HAVE READJUSTED THEIR PRICES ON LOWER LEVEL

	30 x 3		32 x 3½		34 x 4		36 x 4½	
	Old	New	Old	New	Old	New	Old	New
Batavia								
Plain tread	\$14.20	\$12.15*	\$20.00	\$18.00	\$29.65	\$26.70	\$39.50	\$34.55
Security tread	17.10	12.35†	24.00	21.00	35.15	30.75	45.75	38.90
Red tube	3.50	3.00	4.50	3.85	6.25	5.30	8.25	7.00
Federal								
Plain tread	11.70	9.35	16.75	13.95	24.35	20.35	35.00	28.70
Rugged tread	13.80	10.75	19.70	16.05	28.50	23.40	40.95	33.00
Gray tube	2.80	2.35	3.70	2.80	4.90	4.00	6.45	5.20
Redskin tube	3.10	2.60	4.30	3.10	5.45	4.45	7.20	5.80
Michelin								
Soft bead	13.00	11.50	19.75	16.50	28.00	24.50	35.50	31.75
Q. D. clincher .....	...	...	20.75	18.00	28.00	24.50	35.50	31.75
Q. D. straight side .....	...	...	20.75	18.00	28.00	24.50	35.50	31.75
Steel studded	22.00	22.00	30.00	30.00	38.50	38.50	46.00	46.00
Tube	3.50	2.90	4.50	3.50	6.25	4.95	8.25	6.60
Miller								
Smooth tread	12.25	10.95	18.60	16.50	27.05	23.95	38.90	32.15
Non-skid	14.10	12.60	21.40	19.00	31.10	27.55	44.75	36.95
Gray tube	2.80	2.35	3.70	2.80	4.90	4.00	6.45	5.20
Republic								
Plain tread	13.25	11.35	18.35	15.70	28.25	23.80	40.00	34.20
Staggard tread	19.10	16.35	26.75	22.85	36.40	31.15	48.95	41.85
W M tread	13.95	11.95	19.35	16.55	29.75	25.45	42.10	36.00
Gray tube	2.90	2.30	3.90	3.05	5.35	4.20	7.00	5.50
Red tube	4.20	3.30	5.30	4.20	6.40	5.05	9.55	7.50

* Molded. Wrapped, \$12.80. † Molded. Wrapped, \$14.95.

Tradesmen Who Assume New Duties

Resignations and Promotions Place Many Workers in New Positions—Few Leave Industry

William E. Leggett has become affiliated with the Paige-Detroit Co., Boston.

E. G. Shick has been appointed manager of the Cincinnati agency of the Goodyear Tire & Rubber Co.

J. T. Travis has been appointed sales manager of the Carpenter Motor Vehicle Co., Brooklyn, N. Y., agent for the King.

R. H. Henderson is now sales manager of the Pacific Metal Products Co., Los Angeles distributor of Moore and Commerce trucks.

D. G. Caywood, formerly New York manager of the Brunner Mfg. Co., Utica, has been appointed sales manager with headquarters at the factory.

Joseph F. Burns, for some time a member of the Boston branch of the Jackson Motor Car Co., has joined the C. A. Robinson Co., Regal distributor.

R. P. Bishop has been appointed assistant sales manager of the King Motor Co., Detroit. Formerly he was sales manager of the Cutting Motor Car Co.

J. F. Bowman, assistant to the secretary and treasurer of the Federal Motor Truck Co., has been appointed director of sales. He starts on a business tour this week.

W. M. Towne, formerly with the Ajax-Grieb Rubber Co. in Detroit, is now a general sales representative of the F. E. Castle Co., Detroit, manufacturers' representative.

William A. McLain, Jr., until recently with the Sanford street garage, Worcester, Mass., is now in charge of the Velie agency for the Chamberlain Garages Co., New Bedford.

W. A. Haslett has been appointed manager of the Detroit branch of the Goodyear Tire & Rubber Co. He was until recently manager of the company's branch in Pittsburgh, Pa.

W. G. Schmunk has been appointed manager of the Ohio branch of the Peerless Motor Car Co., Cleveland. He has been connected with the Peerless organization for the last five years.

W. J. Trudell, traveling representative for the Goodyear Tire & Rubber Co., Akron, has taken up headquarters in the Adams Hotel, Jackson, Mich., and will be located there permanently.

W. A. Pearne, formerly of Vancouver, B. C., and Spokane, with the Winton, has been engaged as manager of Geo. W. Miller's used parts and supply department at 714 East Pike street, Seattle.

Merrill B. Moores, who has been identified with the automobile industry of Portland, Ore., for the past seven years, has become affiliated with the Northwest Auto Co., distributor of Cole and Reo cars.

Irving B. Meers, formerly export sales manager for the same company, has been appointed commercial manager of the Empire Automobile Co., Indianapolis. He is now on an extended trip through the West.

Hugh T. Porter has been made sales manager of the Detroit-Cadillac Motor Car Co., New York; he formerly was connected with the Locomobile branch in that city. He succeeds J. H. Johnson, who resigned.

Chas. R. Talbot, vice-president of the National Bank of Commerce, Detroit, has been elected president of the Holihan Mfg. Co., Detroit. **Wm. Christian** has been appointed manager and succeeds Jas. A. Holihan, who has resigned.

H. R. Roberts, former head of the Winton branch in Portland, Oregon, has been made sales manager for the Frank C. Riggs Co., Portland Packard distributor. Roberts is president of the Portland Automobile Dealers Association.

J. B. Orman has been placed in charge of the funeral equipment department of the Premier Motor Mfg. Co., Indianapolis, by Receiver Frank E. Smith. Orman was advertising director of the company before it went into the hands of a receiver.

Henry Lonsdale, until recently general manager of the Krit Motor Car Co., and previously during a period of six years with the Cadillac Motor Car Co., has become identified with the Denby Motor Truck Co., Detroit, having been elected vice-president.

W. E. Biggers, formerly associated with the Packard and the Ford companies, has joined the Hyatt Roller Bearing Co., Detroit, in the capacity of advertising manager. He will make his headquarters at the Detroit office, though he will spend much of his time traveling.

George A. Davidson, for ten years well known to automobile and tire interests throughout New York state, has taken the general agency in Pennsylvania, Delaware and Maryland for the Universal Tractor Mfg. Co., Columbus, O., builders of power-driven farm machinery.

L. F. Smith, district manager in Columbus, O., for the Maxwell Motor Car Co., has been promoted to the management of the New York city branch and will have territory in Connecticut, Rhode Island, New Jersey, Long Island and part of New York state. He will assume charge about March 1.

P. K. Hexter, formerly president of the Hexter Gas Electric Vehicle Corp., New York, has been appointed eastern district sales manager of the Republic Motor Truck Co., Alma, Mich. He will make his headquarters in New York city and will have charge of all sales made in Republic trucks east of Pittsburgh.

R. A. Vail has been made vice-president and general manager and **S. R. Chenoweth** treasurer, and **P. A. Watson**, who has been superintendent for some time, has been made a director of the Rutenber Motor Co., Marion, Ind. These changes follow the retirement of R. O. Berger from the office of vice-president and director and of J. W. Stephenson as treasurer and general manager, both of whom wished to be relieved in order to devote their entire time to their many other and varied interests. J. W. Stephenson retains his interest in the company and his membership in the board of directors.

Minneapolis Branch for Heinze

The Heinze Electric Co., Lowell, Mass., has opened a branch office at 33 South Eleventh street, Minneapolis. It is in charge of Wm. Edwards, formerly manager of the branch in Kansas City.

Croxtan Plant Sold for \$25,000

The property of the Croxtan Motor Car Co., Washington, Pa., was sold at sheriff's sale February 13 for \$25,000 to J. I. Brownson, A. M. Linn and J. D. Bigger, trustees of the guarantee fund of the Washington Board of Trade.

Motor Car Securities Quotations

	Feb. 20, 1914	Feb. 20, 1915
	Bid	Asked
Ajax-Grieb Rubber Co., com.	200	250
Ajax-Grieb Rubber Co., pfd.	99	102
Aluminum Castings, pfd.	97	100
Chalmers Motor Co., com.	85	90
Chalmers Motor Co., pfd.	92	94
Firestone Tire & Rubber Co., com.	278	275
Firestone Tire & Rubber Co., pfd.	109	110 1/2
General Motors Co., com.	73	75
General Motors Co., pfd.	92	94
R. F. Goodrich Co., com.	24 1/2	25 1/2
R. F. Goodrich Co., pfd.	89	91
Goodyear Tire & Rubber Co., com.	210	218
Goodyear Tire & Rubber Co., pfd.	94 1/2	98
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	5	...
International Motor Co., pfd.	15	...
Kelly-Springfield Tire Co., com.	...	108
Kelly-Springfield Tire Co., 1st pfd.	...	83 1/2
Kelly-Springfield Tire Co., 2nd pfd.	...	120
Maxwell Motor Co., 1st pfd.	5	5 1/2
Maxwell Motor Co., 2nd pfd.	27	28
Miller Rubber Co., com.	...	150
Miller Rubber Co., pfd.	...	101
Packard Motor Car Co., com.	...	99
Packard Motor Car Co., pfd.	91	98
Peerless Motor Car Co., com.	15	25
Peerless Motor Car Co., pfd.	75	80
Portage Rubber Co., com.	...	40
Portage Rubber Co., pfd.	...	80
Reo Motor Car Co., com.	17 1/2	18 1/2
Reo Motor Truck Co., com.	7 1/2	8 1/2
Stewart-Warner Speed Corp., com.	55	55
Stewart-Warner Speed Corp., pfd.	76	100
Studebaker Corp., com.	84 1/2	85 1/2
Studebaker Corp., pfd.	84 1/2	85 1/2
Swinehart Tire & Rubber Co., com.	70	72
U. S. Rubber Co., com.	50 1/2	50
U. S. Rubber Co., pfd.	101 1/2	102
White Co., pfd.	105	110
Willis-Overland Co., com.	64	68
Willis-Overland Co., pfd.	92	95

WINDOW DISPLAY PLAN OF RICE ASSOCIATION

Dealers in Members' Products Competing for Total of \$15,000—463 Prizes and Few Restrictions

Window displays by motor car and accessory dealers will play an important part in the award of prizes in a window display contest which will be brought to a close May 15 by the Rice Leaders of the World Association; this organization, whose membership includes but one from each trade and whose emblem bears the words "honor," "quality," "strength" and "service," is offering \$15,000 in prizes to dealers for window displays of the products of members.

A recent member is the Splitdorf Electrical Co., representing its field. Others allied with the motor car industry are: Willys-Overland Co., Anderson Electric Car Co., International Acheson Graphite Co., Yale & Towne Mfg. Co., New Haven Clock Co., Berry Bros., Inc., Carborundum Co. and L. S. Starrett Co. There are 463 prizes. They are:

First prize	\$2,000
Second prize	1,000
Third prize	500
Fourth prize	250
Fifth prize	250
Sixth prize	250
Seventh prize	250
Eighth prize	250
Ninth prize	250
Tenth prize	250
Eleventh prize	250
Twelfth prize	250
Thirteenth prize	250
Next 20 prizes, each	100
Next 30 prizes, each	50
Next 100 prizes, each	25
Next 300 prizes, each	10

The dealer who contemplates entering the contest must first write to the Rice association, 5th avenue and 34th street, New York City, announcing this intention and asking for a lithographed banner, 20 x 40 inches, which must be featured in the display. The display must stand in the window for one week and a photograph of it must be sent to the association. There is no limit to the number of displays the dealer may make. Judging will be from the photographs by three men of national reputation.

Also there is no limit to the number of prizes a dealer may win. If he submits ten windows and they are adjudged the best he will be given the first ten prizes. Divisions as to trades are not considered in the award. A motor car window may be first, or dry goods may be first; the merit of the window is what will count.

A feature of the contest of value to the competing dealers is the presentation after the close to every competing dealer of an album containing 100 of the best windows, the first of the prize winners. This album will contain many ideas in window design and will be valuable in the dealer's future display work. Each competitor gets an album even if he is not a prize winner.

Members of the association are also conducting salesmen's contests in their several organizations, but these are not conducted by the association itself as is



Banner of the Rice Association which must be a part of every competing window display

the window contest. These sales contests will close at different times during the summer. Both contests are of a year's duration.

The association was founded several years ago by Elwood E. Rice, who is its president. In the heraldry of the organization the laurel wreath typifies honor, a recognized reputation for fair and honorable business dealings; the wheat sheaf stands for quality, an honest product, of quality truthfully presented; the lion signifies strength, a responsible and substantial financial standing; the speeding courier represents service, a recognized reputation for conducting business in a prompt and efficient manner.

Ohio Electric Officials Change

A number of changes have been made in the officials of the Ohio Electric Car Co. Toledo. M. V. Barbour is now president of the company. He is a member of the Barbour & Star Lumber Co. C. M. Foster has been appointed vice-president and general manager. Herman H. Brand is secretary-treasurer. The board of directors is composed of the officers and J. F. Vogel, of the Gendron Wheel Co.; A. E. Baker, of Baker Bros.; Rathbun Fuller, attorney, and H. E. Marvin, of Walding, Kinnan & Marvin, attorneys.

WOULD DOUBLE FEE FOR REGISTRATION OF CARS

New York Legislature, as Usual, Has a Grist of Bills Aimed at the Motor Car—Everybody a Chauffeur

If the provisions of a measure introduced into the New York legislature by Senator Hewitt of Cayuga are enacted into law, the registration fees for passenger vehicles will be doubled and in addition a heavy burden will be placed on the operators of commercial vehicles and passenger buses. Here are the fees advocated by the Hewitt measure as compared with those at present in force:

PASSENGER CARS			
H. P. rating	Hewitt	Present	H. P. rating
25 or less	\$10	\$5	25 or less
25 to 40	20	10	25 to 35
40 to 50	30	15	35 to 50
50 and over	50	25	50 and over
Electric	10	5	Electric

COMMERCIAL VEHICLES

25 to 40 and weighing over 4,000 lbs. } \$30
Electric weighing over 4,000 lbs. } 20

\$5 additional to minimum fee for each passenger seating capacity and \$25 additional to minimum fee for each ton of carrying capacity of baggage or freight for a motor vehicle, electric or otherwise operated as a bus.

For both gasoline and electric cars irrespective of horsepower rating or capacity.

In addition to this measure, which is probably the most drastic of all those at present in the legislative mill, there are some 19 others, the most important of which are as follows:

Assembly Bill No. 19, introduced by Kramer, which provides that all provisions now applying to chauffeurs be made applicable to every operator of a motor vehicle; that is, license, examination, badge, etc.

Senate Bill No. 180, introduced by Simpson, which amends the Penal law in relation to injuring or removing road signs or danger signs on the highway and makes the displaying of advertising matter on the highway a misdemeanor, either offense being punishable by a fine of not less than \$5 nor more than \$25 or by imprisonment for not more than 10 days or by both.

Senate Bill No. 332, introduced by Cristman, which would transfer to the state commissioner of highways the power and duties of the secretary of state in relation to motor vehicles.

Assembly Bill No. 470, introduced by Flammman, which provides that every operator of a motor vehicle must pass an examination and carry out all the provisions now applicable to chauffeurs and obtain a license at a cost of \$3; no person under 18 years shall be licensed.

Assembly Bill No. 575, introduced by Pratt, which also provides for the transfer of the duties of the secretary of state in relation to motor vehicles to the state highway commission.

Adams Bros. Elect Officers

At the annual meeting of the stockholders of the Adams Brothers Co., Findlay, O., Dr. N. L. MacLachlan was elected president; Murray Irwin, vice-president and general manager; G. M. Carter, secretary; B. B. Bigelow, treasurer. These officers and E. C. Edwards, W. F. Hosler, W. A. Hollington, and J. G. Kwiss were elected directors. F. E. Liddle, formerly of Jackson, Mich., has been appointed factory superintendent.

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT											
K	4-4½x5½	Spldr	Zenith	A-Lite	Diak	3	116	34x4	1,785	....	....
L	4-4½x5½	Spldr	Zenith	A-Lite	Diak	3	121	36x4½	2,085	....	....
F	6-3½x5½	Boach	Zenith	A-Lite	Diak	4	130	35x4½	2,190	2,190	2,290
H	8-3½x4½	Battery	Zenith	Remy	Diak	4	116	34x4	1,685	....	....
ALLEN											
34	4-3½x5	Wths	Stmbg	Wths	Cone	3	110	32x3½	895	895	....
ALTER											
4-27	4-3½x4½	Remy	Holley	Remy	Diak	3	106	30x3½	685	685	....
APPERSON											
4-40	4-4 x5	.....	.....	.....	Band	3	116	34x4	1,350	....	....
4-45	4-4½x5	.....	.....	.....	Band	3	120	36x4	1,685	1,685	....
6-60	6-4½x5	.....	.....	.....	Band	3	....	36x4	2,200	2,250	2,350
6-45	6-3½x5½	.....	.....	.....	Band	3	122	34x4	1,485	....	....
ARBENZ											
1915	4-4½x5½	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,835	....
ARGO											
Argo	4-2 5-16x4	A. Kent	Argo	.....	Cone	3	90	28x2½	295	....	....
AUBURN											
4-36	4-3½x5	.....	Rafid	.....	Cone	3	114	32x4	1,075	1,075	....
6-40	6-3½x5	.....	Rafid	.....	Cone	3	126	34x4	1,550	....	....
6-47	6-3½x5½	Boach	Rafid	.....	Cone	3	135	37x4½	2,000	....	....
AUSTIN											
66	6-4½x6	Wths	Master	Wths	Diak	6	141	34x4½	3,600	3,600	3,600
BAUER											
B	4-4½x5	Mea	Shblr	Emran	Diak	3	110	34x3½	875	1,000	....
BRISCOE											
B	4-3½x5½	Spldr	.....	Apico	Cone	3	107	30x3½	785	785	....
BUICK											
C-24-5	4-3½x3½	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	....
C-36-7	4-3½x5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	....
C-54-5	6-3½x5	Delco	Marvel	Delco	Cone	3	130	36x4½	1,650	....	1,650
CADILLAC											
51	8-3½x5½	Delco	Own	Delco	Diak	3	122	36x4½	1,975	1,975	1,975
CARTER-CAR											
9	4-3½x5	Delco	Shblr	Delco	.....	....	106	33x4	1,250	....	....
CASE											
35	4-4½x5½	Boach	Rafid	Wths	Diak	3	120	35x4½	1,600	....	....
40	4-4½x5½	Boach	Rafid	Wths	Diak	3	124	37x4½	1,800	2,000	....
25	4-3½x4½	Wths	Stmbg	Wths	Diak	3	115½	34x4	1,350	....	....
CHADWICK											
19	6-5 x6	Boach	Own	Wths	Band	4	....	37x5	5,500	5,500	5,500
CHALMERS											
26-B	6-3½x5½	A. Kent	Rafid	Entz	Diak	3	125½	34x4½	1,650	1,725	....
M-6	6-4 x5½	Boach	Rafid	Entz	Diak	4	132	36x4½	2,400	2,400	....
33	6-3½x5	A. Kent	Rafid	G & D	Diak	3	120	34x4	1,400	....	....
CHANDLER											
15	6-3½x5	Boach	Rafid	G & D	Diak	3	120	34x4	1,295	....	....
CHEVROLET											
H-4	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	....	875	....
H-2	4-3 11-16x4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	....	....
COLE											
4-40	4-4½x5½	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,885	1,885	1,885
6-51	6-3½x5	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	Delco	Stmbg	Delco	Cone	3	136	37x5	2,465	2,465	2,465
CRAWFORD											
6-35	6-2½x5	Wths	Stmbg	Wths	Diak	3	120	34x4	1,850	1,850	....
CROW											
E-42	4-4 x5	G & D	Shblr	Emran	Diak	3	114	33x4	1,150	1,165	....
E-52	4-4½x5½	G & D	Shblr	Emran	Diak	3	120	34x4	1,475	1,600	....
E-62	6-3½x5½	G & D	Shblr	Emran	Diak	3	130	36x4	1,895	1,895	....
C.E.Jr	4-2½x4½	Disco	Holley	Disco	Diak	3	104	30x3½	725	....	....
CUNNINGHAM											
8	4-4½x5½	Undec	Stmbg	Undec	Diak	3	120	37x5	....	....	3,750
CYCLEPLANE											
Tour	4-2½x4	A. Kent	Own	.....	Diak	3	106	28x3	350	....	....
Trav	2-3½x4	A. Kent	Shblr	.....	....	....	96	28x3½	250	....	....
DAVIS											
33-A	4-3½x5	Wths	Stmbg	Wths	Cone	3	112	34x4	1,235	1,235	....
6-D	6-3½x5½	Boach	Stmbg	G & D	Diak	4	128	37x4½	2,185	....	....
DETROITER											
C	4-3½x5	Remy	Stmbg	Remy	Diak	3	112	32x3½	....	885	....
DILE											
A	4-2½x4	Bring	Holley	.....	Diak	3	96	28x3	485	....	....
DODGE											
...	4-3½x4½	Elsmn	Own	N E	Cone	3	110	32x3½	....	785	....
DORRIS											
LA-4	4-4½x5	Wths	Stmbg	Wths	Diak	3	121	36x4½	2,200	2,250	....
DORT											
Four	4-3 x4	Conn	.....	.....	Cone	3	....	30x3	465	....	....
Five	4-3½x5	Conn	.....	.....	Cone	3	....	30x3½	....	680	....
DRIGGS-SEABURY											
C	4-2½x4	Mgnto	.....	.....	Cone	2	100	28x3	395	....	....
A	4-2½x4	Mgnto	.....	.....	Frn Trs	100	....	....	395	....	....
EMPIRE											
31-40	4-3½x4½	Remy	Holley	Remy	Diak	3	108	32x3½	975	975	....
ENGER											
6-50	6-3½x5	A. Kent	Rafid	G & D	Diak	3	125	34x4	1,495	....	1,495
FIAT											
55	4-130x170	Boach	Own	Wths	Diak	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	Boach	Own	Wths	Diak	4	135	37x5	5,150	5,150	5,150
54	4-110x150	Boach	Own	Wths	Diak	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS											
82-E	4-4½x5½	Spldr	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	....
90-E	6-4½x5½	Conn	Rafid	G & D	Diak	3	132	36x4	....	2,500	2,650
FORD											
T	4-3½x4	Ford	Holley	.....	Diak	2	100	30x3	440	490	....
FRANKLIN											
6-30	6-3½x4	Elsmn	Own	Dyneto	Diak	3	120	34x4½	2,150	2,150	....
F. R. P.											
45-B	4-4 3-5x6	Boach	Stwrt	Boach	Cone	4	110	36x4	All bodies to order	....	....
GLIDE											
30	4-3½x5	Wths	Shblr	Wths	Diak	3	114	32x4	1,195	1,195	....
GRANT											
M	4-2½x4	Swiss	Mayer	A-C	Cone	2	90	28x3	425	....	....
T	6-2½x4½	A. Kent	Mayer	A-C	Cone	3	106	30x3½	....	795	....
GREAT WESTERN											
A	4-4½x5½	Kngstn	Kngstn	G & D	Cone	3	117	36x4	1,710	1,710	....
B	4-3½x5½	Kngstn	Kngstn	Boach	Cone	3	117	34x4	2,200	....	....
HALLADAY											
6-40	6-	Wths	Stmbg	Wths	Diak	3	....	34x4	....	1,385	....
HAYNES											
30	6-3½x5	Remy	Rafid	L-N	Diak	3	121	34x4	1,485	1,485	....
31	6-4½x5½	Simms	Stmbg	L-N	Band	3	130	36x4½	....	2,250	....
33	6-3½x5	Remy	Rafid	L-N	Diak	3	127	35x4½	....	1,950	....
32	4-4½x5½	Simms	Stmbg	L-N	Band	3	118	34x4	....	1,000	....
HERFF-BROOKS											
4-40	4-4½x5	Boach	Stmbg	Apico	Cone	3	118	34x4	1,100	1,100	....
6-50	6-4 x4½	Boach	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	....
HERRESHOFF											
4-16	4-2½x3½	A. Kent	Ctrr	Dyneto	Cone	3	94	28x3	500	....	....
HUDSON											
6-40	6-3½x5	Delco	Zenith	Delco	Diak	3	123½	34x4	1,550	....	1,550
6-54	6-4½x5½	Delco	Zenith	Delco	Diak	4	135	36x4½	....	2,350	....
HUPMOBILE											
H	4-3½x5½	Boach	Zenith	Wths	Diak	3	106	33x4	1,650	1,650	....
K	4-3½x5½	A. Kent	Zenith	Wths	Diak	3	118	34x4	1,200	1,200	1,235
IMPERIAL											
94	4-3½x5	A. Kent	Stmbg	G & D	Diak	3	115	32x3½	....	1,085	....
56	6-3½x5½	Spldr	Stmbg	N E	Diak	3	130	36x4½	....	2,300	....
66	6-3 x5	.....	.....	.....	Diak	3	....	33x4	....	1,285	....
INTER-STATE											
T	4-3½x5	Remy	Shblr	Remy	Cone	3	110	33x4	....	1,000	....
JACKSON											
46	4-4½x5½	Remy	Shblr	A-Lite	Cone	3	117	34x4	1,375	1,375	....
48-6	6-3½x5	Delco	Stmbg	Delco	Cone	3	125	34x4½	....	1,650	....
JEFFERY											
Four	4-3½x5½	Boach	Rafid	U S L	Cone	4	116	34x4	1,535	1,450	....
Str	6-3½x5½	Boach	Rafid	U S L	Diak	4	133½	34x4½	....	2,400	....
Chfd	6-3 x5	Boach	Stmbg	BiJur	Diak	4	123	34x4	1,650	1,650	....
KEARNS											
L	4-2½x4	Bring	Zenith	A-C	Cone	3	100	28x3	450	....	....
KING											
...	4-3 15-16x5	A. Kent	Stmbg	W. Lrnd	Diak	3	113	33x4	1,075	1,075	....
...	8-2½x5	A. Kent	Zenith	W. Lrnd	Diak	3	113	33x4	....	1,360	....
KISSEL											
4-36	4-4½x5½	Wths	Stmbg	Own	Cone	3	121	34x4	1,450	1,450	1,500
6-42	6-3½x5½	Wths	Stmbg	Kissel	Cone	3	126	34x4	1,650	1,650	1,650
6-48	6-4 x5½	Mea	Rafid	Kissel	Cone	4	137½	36x4½	2,350	2,350	2,360
6-60	6-4½x5½	Boach	Rafid	Kissel	Cone	4	142	37x5	2,150	2,150	2,150
KLINE											
6-42	6-3½x5½	Wths	.....	Wths	Diak	3	123	34x4	1,750	1,750	....
6-42A	6-3½x5½	Wths	.....	Wths	Diak	3	127	36x4½	....	1,900	....

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT											
O	4-3/4x4	Disco	Johns	Disco	Disk	3	108	32x3 1/2	850	850	....
M	4-3/4x4	Bosch	Stmbg	N E	Disk	3	108	32x3 1/2	995	995	....
LAMBERT											
48-C	4-3/4x4	Briggs	Shblr	Briggs	.....		112	32x3 1/2	1,200	1,200	....
68-C	4-4 1/2x5 1/2	Briggs	Shblr	Briggs	.....		117	34x3 1/2	1,565	1,565	....
LENOX											
Four	4-4 1/2x5 1/2	Waths	Own	Waths	Cone	3	118	34x4 1/2	2,000	2,000	....
Six	6-3/4x5 1/2	Waths	Own	Waths	Cone	3	130	34x4 1/2	2,465	2,465	....
LEWIS											
...	6-3/4x6	Briggs	Stmbg	Remy	Disk	3	135	36x4	1,600	1,600	....
LEXINGTON											
Four	4-3/4x5 1/2	Waths	Shblr	Waths	Disk	3	115	34x4	1,375	1,375	....
6-L	6-3/4x5	Waths	Shblr	Waths	Disk	3	128	34x4	1,875	1,875	....
6-M	6-4 1/2x5	A. Kent	Stmbg	Jesco	Cone	3	130	36x4 1/2	2,575	2,575	2,675
LOCOMOBILE											
M-5	6-4 1/2x5 1/2	Bosch	Own	Waths	Disk	4	140	37x5	5,100	5,100	....
R-5	6-4 1/2x5	Bosch	Own	Waths	Disk	4	132	37x5 1/2	4,400	4,400	....
LUVERNE											
700	6-4 x5	Bosch	Shblr	Jesco	Disk	3	123	36x4 1/2	2,500	2,500	....
LYONS-KNIGHT											
K-4	4-4 1/2x5 1/2	Simms	Stmbg	N E	Disk	3	130	37x5	2,900	2,900	....
MARION											
...	8-3/4x4 1/2	Bosch	.....	G & D	Disk	3	115	34x4	1,500	1,500	....
...	6-3 x5	Bosch	.....	G & D	Disk	3	122	34x4	1,350	1,350	....
...	4-3/4x5	Bosch	.....	G & D	Disk	3	115	34x4	1,250	1,250	....
MARMON											
41	6-4 1/2x5 1/2	Bosch	Stmbg	Bosch	Cone	3	132 1/2	36x4 1/2	3,250	3,250	3,350
48	6-4 1/2x6	Bosch	Zenith	Roth	Disk	3	145	37x5 1/2	5,000	5,000	....
MAXWELL											
25	4-3/4x4 1/2	Simms	Kingstn	Simms	Cone	3	103	30x3 1/2	725	750	....
McFARLAN											
T	6-4 x6	Waths	Stmbg	Waths	Cone	3	132	36x4 1/2	2,590	2,590	2,590
X	6-4 1/2x6	Waths	Stmbg	Waths	Cone	3	132	36x4 1/2	2,900	2,900	2,900
McINTYRE											
25	4-3/4x5 1/2	Bosch	Stmbg	G & D	Cone	3	106	32x3 1/2	850	850	....
6-40	6-3/4x4 1/2	Briggs	Stmbg	Briggs	Disk	3	120	35x4	1,275	1,275	....
MERCER											
Spdstr	4-3/4x6	Bosch	Zenith	U.S.L.	Disk	4	130	34x4 1/2	2,750	2,750	....
Rdstr	4-3/4x6	Bosch	Zenith	U.S.L.	Disk	4	130	34x4 1/2	3,000	3,000	....
METEOR											
42	4-4 x5	A. Kent	Stmbg	Spdfr	Disk	3	114	34x4	1,075	1,075	....
45	6-3/4x5	A. Kent	Stmbg	Spdfr	Disk	3	126	35x4	1,395	1,395	....
METZ											
22	4-3/4x4	Bosch	Own	G & D	.....		96	30x3	495	495	....
25	4-3/4x4	.....	A. W. T.	G & D	.....		105	32x3 1/2	600	600	....
MITCHELL											
Four	4-4 x5 1/2	Conn	.....	Spdfr	Cone	3	116	34x4	1,250	1,250	....
Six	6-4 x5 1/2	Conn	.....	Spdfr	Cone	3	123	36x4	1,585	1,585	....
7-8	6-4 1/2x7	Remy	.....	Remy	Cone	3	144	37x5	2,350	2,350	....
5-8	6-4 1/2x6	Remy	.....	Remy	Cone	3	132	36x4 1/2	1,895	1,895	....
MOLINE-KNIGHT											
...	4-4 x6	Bosch	Shblr	Wgner	Cone	4	123	36x4 1/2	2,500	2,500	2,500
40	4-3/4x5	Conn	.....	.....	Cone	3	114	31x4	1,475	1,475	....
MONARCH											
Six	6-3/4x5	A. Kent	Zenith	W. Lnd	Cone	3	125	33x4	1,250	1,250	1,275
MONROE											
M-2	4-3 x3 1/2	Conn	Zenith	A-Lite	Cone	3	96	30x3	460	460	....
MOON											
4-38	4-3/4x5	Delco	Rafid	Delco	Disk	3	122	34x4	1,350	1,350	....
6-40	6-3/4x5	Delco	Rafid	Delco	Disk	3	122	34x4	1,575	1,575	....
6-50	6-3/4x5 1/2	Delco	Rafid	Delco	Disk	4	130	35x4 1/2	2,150	2,150	....
MORSE											
D	4-4 1/2x5	Elsmn	Stmbg	G & D	Disk	4	127	36x4 1/2	3,600	3,600	3,600
NATIONAL											
AB	6-3/4x5 1/2	Elsmn	Rafid	Waths	Cone	3	134	36x4 1/2	2,375	2,375	....
NORWALK											
F	6-3/4x5 1/2	A. Kent	Rafid	G & D	Disk	4	131	37x4	1,875	1,875	....
OAKLAND											
37	4-3/4x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,150	1,200	....
40	6-3/4x5	Delco	Johnm	Delco	Cone	3	123 1/2	35x4 1/2	1,885	1,885	....
Spdstr	4-3/4x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,100	1,100	....
OGREN											
Six	6-3/4x5 1/2	Bosch	Rafid	B-Rahmr	.....	3	.....	.....	2,500	2,500	....
OLDSMOBILE											
42	4-3/4x5	Delco	Marvel	Delco	Cone	3	113	33x4	1,285	1,285	....
55	6-4 1/2x5 1/2	Delco	Marvel	Delco	Cone	3	139	36x5	2,975	2,975	....
OVERLAND											
80	4-4 1/2x4 1/2	Bosch	Shblr	A-Lite	Cone	3	114	34x4	1,050	1,075	....
81	4-4 x4 1/2	Spdfr	Shblr	A-Lite	Cone	3	106	33x4	795	850	....
82	6-3/4x5 1/2	Bosch	Shblr	A-Lite	Cone	3	125	35x4 1/2	1,475	1,475	....
OWEN											
...	6-3/4x5 1/2	Owen	Master	O.M.	O.M.		138	35x5	3,750	3,750	3,750
PACKARD											
3-38	6-4 x5 1/2	Bosch	Own	Bljur	Plate	3	140	37x5 1/2	3,750	3,750	3,850
5-48	6-4 1/2x5 1/2	Bosch	Own	Bljur	Plate	3	144	37x5	4,750	4,750	4,850
PAIGE											
Six	6-3/4x5 1/2	Bosch	Rafid	G & D	Disk	3	124	34x4	1,395	1,395	1,395
38	4-4 x5	Bosch	Stwrt	G & D	Disk	3	116	34x4	1,075	1,075	....
PARTIN-PALMER											
20	4-3/4x4	A. Kent	Muir	G & D	Disk	3	96	28x3	485	485	....
38	4-3/4x5 1/2	A. Kent	Stmbg	G & D	Cone	3	115	33x4	1,000	1,000	....
PATERSON											
4-32	4-3/4x5	Delco	Stmbg	Delco	Cone	3	112	33x4	1,095	1,095	....
6-48	6-3/4x5	Delco	Stmbg	Delco	Cone	3	124	34x4	1,495	1,495	....
PATFINDER											
...	6-3/4x5 1/2	Waths	Shblr	Waths	Disk	4	126	34x4 1/2	2,222	2,222	2,322

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PEERLESS											
54	4-3/4x5	A. Kent	Stmbg	G & D	Disk	3	113	34x4	2,000	2,000	....
55	6-3/4x5	A. Kent	Stmbg	G & D	Disk	3	121	34x4	2,250	2,250	....
48-6	6-4 1/2x6	Bosch	Own	G & D	Band	4	137	37x5	4,900	4,900	5,000
PETER PAN											
3-E	4-2 1/2x4 1/2	Brig	.....	.....	Disk	3	110	29x3 1/2	650	....	....
PIERCE-ARROW											
C-3	6-4 x5 1/2	Bosch	Own	Waths	Cone	4	134	36x4 1/2	4,300	4,300	....
B-3	6-4 1/2x5 1/2	Bosch	Own	Waths	Cone	4	142	37x5	4,900	4,900	5,000
A-3	6-5 x7	Bosch	Own	Waths	Cone	4	147 1/2	38x5 1/2	5,900	5,900	6,000
PILOT											
55	6-3/4x5 1/2	Waths	Shblr	Waths	Cone	3	126	34x4	1,885	1,885	1,985
75	6-4 1/2x6	Waths	Crtr	Waths	Cone	3	132	37x4 1/2	2,885	2,885	2,885
PREMIER											
6-50	6-4 x5 1/2	Elsmn	Rafid	Remy	Disk	3	132	36x4 1/2	1,985	1,985	1,985
PRATT											
6-50	6-3/4x5 1/2	A. Kent	Rafid	G & D	Disk	4	132	37x4 1/2	2,150	2,150	2,250
PULLMAN											
Jr	4-3/4x4 1/2	Spldf	Stmbg	Spldf	Disk	3	110	30x3 1/2	740	740	....
6-48	6-3/4x5 1/2	Simms	Stmbg	Waths	Disk	4	134	36x4 1/2	2,500	2,500	2,550
RAYFIELD											
20	4-2 1/2x4 1/2	.....	Own	.....	Disk	3	96	28x3	....	395	....
R-C-H											
K	4-3/4x5	Bosch	B-D	W. Lnd	Cone	3	110	32x3 1/2	....	775	....
REGAL											
D	4-3/4x5	A. Kent	Stwrt	Bosch	Cone	3	112	33x4	1,085	1,085	....
...	8-2 1/2x4 1/2	.....	Stwrt	H. Rshmr	.....		112	33x4	1,250	1,250	....
...	4-3/4x3 1/2	.....	.....	Spldf	.....	3	106	30x3 1/2	650	650	....
REMINGTON											
...	4-3/4x4	A. Kent	.....	W. Lnd	Cone	3	106	30x3 1/2	695	695	....
Chn ^d	8-3/4x4 1/2	A. Kent	Zenith	G & D	Disk	3	116	35x4 1/2	1,495	....	....
REPUBLIC											
E	6-4 1/2x5	Delco	Rafid	Delco	Cone	4	133	36x4 1/2	....	2,950	3,000
REO											
M	6-3 9-16x5 1/2	Remy	Johnm	Remy	Disk	3	122	34x4	....	1,385	....
ST	4-4 1/2x4 1/2	Natnl	Holley	Natnl	Disk	3	112	34x4	1,000	....	....
B	4-4 1/2x4 1/2	Remy	Holley	Remy	Disk	3	115	34x4	....	1,050	....
ROSS											
...	8-3 x4 1/2	.....	.....	Own	Disk	3	115	34x4	....	1,350	....
SAXON											
A	4-2 1/2x4	A. Kent	Mayer	.....	Plate	2	96	28x3	395	....	....
B2	6-2 1/2x4 1/2	A. Kent	.....	G & D	Disk	3	112	32x3 1/2	....	785	....
SCRIPPS-BOOTH											
C	4-2 1/2x4	A. Kent	Zenith	Blhr	Cone	3	110	30x3 1/2	775	....	....
SPAULDING											
H	4-4 1/2x5 1/2	Simms	Rafid	Entz	Cone	3	126	36x4	....	1,690	....
S. G. V.											
J	4-3/4x4 1/2	Bosch	Zenith	W. Lnd	Disk	4	118	34x4	3,300	3,300	....
SIMPLEX											
38	4-4 1/2x6 1/2	Bosch	Nwcm	Bosch	Disk	4	137	37x5	All bodies	to order	
50	4-5 1/2x6 1/2	Bosch	Nwcm	Bosch	Disk	4	137	37x5	All bodies	to order	
SINGER											
Six	6-4 x5 1/2	Elsmn	C R G	Waths	Disk	4	135	36x4 1/2	2,350	2,350	....
SPEEDWELL											
I	6-4 1/2x5 1/2	Waths	Shblr	Waths	Disk	3	125	37x5	....	....	2,950
SPHINX											
A-15	4-3/4x5	Spldf	Mayer	Spldf	Cone	3	112	30x3 1/2	....	695	....
STEARNS											
L-4	4-3/4x5 1/2	Bosch	Shblr	G & D	Cone	3	119	34x4	1,750	1,750	....
S-K-4	4-4 1/2x5 1/2	Bosch	Stmbg	G & D	Disk	3	127	36x4 1/2	3,750	3,750	3,900
S-K-6	6-4 1/2x5 1/2	Bosch	Stmbg	G & D	Disk	4	134	37x5	4,850	4,850	5,000
STUDERAKE											
4-SD	4-3/4x5	Remy	Shblr	Wagner	Cone	3	108	32x4	985	985	....
6-E.C.	6-3/4x5	Remy	Shblr	Wagner	Cone	3	121	34x4	....	1,385	1,450
STUTZ											
H.C.8	4-3/4x5	Remy	Stmbg	Remy	Cone	2	108	32x4	1,475	....	....
Br. Cat	4-4 1/2x5 1/2	Bosch	Stmbg	Remy	Cone	3	120	34x4 1/2	2,000	....	....
Six	6-4 x5	Elsmn	Stmbg	Remy	Cone	3	120	34x4 1/2	2,125	....	....
T. Car	4-4 1/2x5 1/2	Bosch	Stmbg	Remy	Cone	3	130	34x4 1/2	....	2,375	....
T. Car	6-4 x5	Elsmn	Stmbg	Remy	Cone	3	130	34x4 1/2	....	2,400	....
TOURAINE											
12	6-4 x5 1/2	Simms	Zenith	Waths	Disk	4	134	34x4 1/2	3,150	3,150	3,250
TRUMBULL											
15-AB	4-2 1/2x4	Spldf	Brze	W. Lnd	Cone	3	80	29x3	395	....	....
TWOMBLY											
...	4-3/4x4	Spldf	Zephyr	Undec	Cone	3	100	30x3	660	750	....
VELIE											
4-45	4-4 1/2x5 1/2	Bosch	Stmbg	G & D	Disk	4	121	37x4 1/2	1,750	1,750	....
6-50	6-3/4x5 1/2	Bosch	Stmbg	G & D	Disk	4	128	37x4 1/2	2,015	2,015	....
Blw1	6-3/4x5	A. Kent	Stmbg	G & D	Disk	4	124	34x4	1,595	1,595	....
VIXEN											
S.B	4-2 1/2x4	A. Kent	Zephyr	.....	.....		106	28x3	395	....	....
VULCAN											
...	4-3/4x5 1/2	Waths	.....	Waths	Disk	3	120	32x3 1/2	975	975	....
WESTCOTT											
O	4-3/4x5	Delco	.....	Delco	Cone	3	113	33x4	1,185	1,185	....
6-3/4x5		Delco	.....	Delco	Cone	3	125	34x4	....	1,685	....
WHITE											
30	4-3/4x5 1/2	Bosch	Own	Own	Plate	4	115	32x4	2,650	2,700	....
45	4-4 1/2x6 1/2	Bosch	Own	Own	Plate	4	132 1/2	36x4 1/2	....	....	3,900
60	6-4 1/2x5 1/2	Bosch	Own	Own	Plate	4	140 1/2	37x5	All bodies	to order	
WILLYS-KNIGHT											
K-19	4-4 x5 1/2	Simms	Zenith	U.S.L	Cone	4	120	36x4 1/2	....	2,475	....
WINTON											
21	6-4 1/2x5 1/2	Bosch	Rafid	Air or Elec	Disk	4	138	37x5	3,350	3,350	3,900
21A	6-3/4x5 1/2	Bosch	Rafid	Air or Elec	Disk	4	128	36x4 1/2	2,285	2,285	....
WOODS MOBILETTE											
3	4-2 1/2x4	Mento	.....	.....	Cone	2	104	28x2 3/4	390	....	....

Motor Car Agencies Recently Established

COMMERCIAL CONNECTICUT

Place	Car	Dealer
Bridgeport	Koehler	Elm Auto Co.

ILLINOIS

Decatur	Koehler	Rehling Brothers
Pana	Koehler	F. P. Renz

LOUISIANA

New Orleans	Denby	Fairchild Automobile Co.
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NEW JERSEY

Washington	Koehler	M. A. Pierson
Whitehouse	Koehler	Burdett Brothers

OHIO

Athens	Koehler	F. E. Goldsberry
Cincinnati	Koehler	Cochran & Co.

PENNSYLVANIA

West Newton	Koehler	McKenery & Britton
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WISCONSIN

Dodgeville	Koehler	Metropolitan Auto Co.
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PASSENGER

CALIFORNIA

Calxico	Case	A. C. Baskin
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CANADA

Montreal	National	Auto Tire & Supply Co., Ltd.
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CONNECTICUT

Hartford	Chevrolet	H. Starkie
Hartford	Stutz	F. L. Caulkins & Co.
Middletown	Stutz	F. L. Caulkins & Co.
New London	Case	J. F. Day

FLORIDA

Jacksonville	Trumbull	Portage Tire Co.
Miami	Lewis	A. H. Bouldin
Tampa	Westcott	Westcott Auto Sales Co.

ILLINOIS

Champaign	Westcott	J. L. Weise
Chicago	Lewis	Simmons Motor Co.
Peoria	Westcott	Westcott Garage

INDIANA

Hartford City	Westcott	A. W. Findall
Huntington	Westcott	Peoples Garage
Walton	Lewis	D. F. Hendrix

IOWA

Burlington	Westcott	Cable Motor Car Co.
Ft. Dodge	Westcott	Knight Motors Co.
Ottumwa	Lewis	Snow Auto Co.

KANSAS

Caldwell	Case	J. Dvorah
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LOUISIANA

New Orleans	Chandler	Fairchild Automobile Co.
New Orleans	Westcott	M. Zilbermann

MAINE

Anson	Dodge Bros.	George Hovey
Bangor	King	Utterback-Gleason Co.
Camden	Kiesel	W. C. Howe
Casco	Maxwell	Cook-Hall Co.
Easton	Detroit	Kneeland Bros.

MARYLAND

Baltimore	Simplex	The Rice Garage
Baltimore	King	Randall Mfg. Co.
Federalburg	Detroit	R. S. Messenger
Preston	Oldsmobile	H. M. Hollis & Co.

MASSACHUSETTS

Boston	Lewis	E. A. Gilmore Co.
Boston	Grant	B. S. Waite Co.
Lynn	Haynes	W. S. Russell Co.
Milford	Ford	Souhegan Auto Co.
Rockland	Trumbull	C. H. Hubbard & Sons

MICHIGAN

Battle Creek	Imperial	Independent Garage
Battle Creek	Saxon	Frank Palmer
Charlevoix	Saxon	B. Brown
Clare	Saxon	Kelley & Ballard
Davison	Dodge	Art Cullen
Detroit	Ohio	Gordon Auto Sales Co.
Detroit	Monarch	Addison Garage
Detroit	Empire	Addison Garage
Detroit	Kiesel	Addison Garage
Detroit	Milburn	E. I. Rumsey
Detroit	Ohio	Ohio Electric Sales Co.
Detroit	Briscoe	Foster Motor Sales Co.
Downs	Overland	L. C. Wells
Downs	Reo	Wilford Miller
Gladston	Lewis	Holmgren Auto Co.
Grand Rapids	Glide	F. P. Oswald
Grand Rapids	Remington	Remington Sales Co.
Holland	Jeffery	F. W. Jackson
Iron River	Case	Iron River Motor Car Co.
Jackson	Saxon	W. T. Murray
Kalamazoo	King	W. O. Harlow
Ludington	Saxon	Cartier Auto & Garage Co.
Manistee	Ford	Traverse Auto Co.
Manistee	Reo	Traverse Auto Co.
Marshall	Argo	O. L. Linn & B. S. Scott
Marshall	Briscoe	O. L. Linn & B. S. Scott
Marquette	Ford	E. W. Jones

Place	Car	Dealer
Montmorency	Ford	G. F. Lister
Perry	Dodge	Dunning & Hart
Port Huron	King	F. S. Church
Saginaw	Argo	Electric Vehicle Service Co.
Saginaw	Boylan	Electric Vehicle Service Co.
Saginaw	Brook	Electric Vehicle Service Co.
Sebewaing	Dodge Bros.	J. Braun

MINNESOTA

Anoka	Lexington	J. H. Ward
Lake Crystal	Case	W. B. Roberts
Lanesboro	Kiesel	J. G. McMaster
Minneapolis	Davis	White Garage
Minneapolis	Lewis	A. F. Chase & Sons Co.
Minneapolis	Westcott	Minneapolis Auto Co.

MISSOURI

Hannibal	Westcott	E. C. Long Mfg. Co.
Kansas City	King	Karshner Motor Car Co.
Kansas City	Stearns-Knight	Scarritt Motor Car Co.
Maysville	Lexington	H. O. Williams
St. Louis	Lexington	Lindell Mot. Car & Rep. Co.
St. Louis	Davis	Cherokee Automobile Co.

NEBRASKA

Fremont	Lewis	A. Koyen
Omaha	Federal	E. E. Moser Co.
Omaha	Standard	E. E. Moser Co.
Omaha	Denby	E. E. Moser Co.
Omaha	Davis	Wilson Auto Co.
Omaha	Commerce	E. E. Moser Co.
Omaha	Stearns-Knight	McIntyre Auto Co.
Omaha	Davis	Freeland Auto Co.

NEW JERSEY

Burlington	Detroit	M. J. Gray
Camden	Detroit	O. O. Phillips
Elizabeth	Ohio	Elizabeth Auto Co.
Gibbsboro	Detroit	H. Parker & Sons
Glen Ridge	Oldsmobile	Glen Ridge Auto Co.
Jersey City	Lewis	Junction Motor Co.
Landville	Detroit	C. F. Riedel
Millville	Detroit	Troth & Keen
Morristown	Oldsmobile	Cain-Henry Motor Car Co.
Mullica Hill	Detroit	J. P. Stratton
Newark	Simplex	J. M. Quinby & Co.
Newark	Kiesel	C. F. Briggs
Newark	Case	North Grove Garage Co., Inc.
Toms River	Detroit	A. W. Brown



Feb. 25, New York, N. Y.—S. A. E. Metropolitan Section meeting; report of Research Committee on Kerosene Carbureters. Research Committee report on Non-Electric Continuous-Torque Transmission.

Feb. 27, San Francisco, Cal.—Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Mar. 3, Albany, N. Y.—United Garage Associations of New York State, general convention.

Mar. 6, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds. Promoter, Panama-Pacific Exposition Co.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.

June 9, Galesburg, Ill.—Two-mile track meet.

June 16, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Association.

June 25, Sioux City, Ia.—Track meet.

July 4-5, Tacoma, Wash.—Speedway Races.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

THE SHOW CIRCUIT

Feb. 22-25, Allentown, Pa.—Show.

Feb. 22-27, Duluth, Minn.—Show.

Place	Car	Dealer
Trenton	Davis	F. P. Hols
Trenton	Detroit	Toman Bros.
Woodstown	Detroit	E. G. Peterson

NEW YORK

Albany	Simplex	Albany Garage Co.
Amenia	Saxon	Amenia Garage
Amityville	Case	Amityville Garage
Brier Hall	Case	A. D. Griffin
Buffalo	Case	C. R. Cool
Buffalo	Lewis	National Motor Car Co.
Buffalo	Simplex	Simcrott Motor Sales Co.
Buffalo	Apperson	Poppenburg Motor Car Co.
Ceres	Detroit	Raymond & Lamphere
Colfax	Case	G. B. Carter & Son
Cortland	Case	C. M. Smith
East Hampton	Case	L. O. Edwards
East Port	Case	L. S. Tuttle
Ellicottville	Detroit	J. E. Doolittle
Elmira	Detroit	J. B. Bishop
Farnham	Detroit	C. J. Peters
Flushing	Case	D. L. Rapelle
Greenport	Case	J. Kluge
Grantsville	Case	J. R. Ellason
Hempstead	Case	National Garage Co.
Hicksville	Case	C. A. Rheinhard
Hillaboro	Case	Richard Bros.
Islip	Case	Gates Auto Garage
Kenoza Lake	Saxon	Thless & De Lap
Livonia	Detroit	Scott W. Crane
Madalin	Oldsmobile	C. M. Otis
Marlboro	Imperial	J. A. Du Bois
Middleport	Detroit	F. A. Whittaker

Recent Losses by Fire

Newtown, Conn.—William Wakelee garage; estimated loss \$3,000.

Fort Wayne, Ind.—Rurode barns; building and several cars damaged; estimated loss on cars about \$2,000; building, \$500.

Grand Rapids, Mich.—Benham building; United States Tire Co., \$7,000; Standard Tire Co., \$1,000; Peck-Johnson Co., \$1,000; Standard Mfg. Co., \$5,000; Lewis Electric Co., \$30,000.

Feb. 22-27, New Haven, Conn.—Automobile show, Second Regiment Armory. W. N. Lindsay, manager.

Feb. 22-27, South Bethlehem, Pa.—Automobile show; Coliseum; J. L. Elliott, manager.

Feb. 23-27, Ft. Dodge, Ia.—Automobile show, Armory.

Feb. 23-27, Syracuse, N. Y.—Automobile show, State Armory, Syracuse Automobile Dealers' Association.

Feb. 24-27, Indianapolis, Ind.—Fort Wayne Auto Trade Association show.

Feb. 24-27, Battle Creek, Mich.—Show, Rathburn & Kraft building; Messrs. Riley and Wattles.

Mar. 1-5, Wilkes-Barre, Pa.—Vehicle Trades Association show.

Mar. 1 to 5, Sioux Falls, So. Dak.—Automobile show, Auditorium.

Mar. 1-6, Utica, N. Y.—Automobile show; Automobile Club of Utica.

Mar. 2-9, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association show; 23rd Regiment Armory.

Mar. 4-6, Springfield, Mass.—Show, J. H. Graham, manager.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

Mar. 8-13, Indianapolis, Ind.—Annual Spring Opening, Indianapolis Auto Trade Association.

Mar. 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

Mar. 8-13, Canton, O.—Stark County Automobile Show and Electrical Exposition show, Auditorium.

Mar. 8-13, Utica, N. Y.—Utica Automobile Trade Association show.

March 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers Association. J. Clyde Myton, manager.

Mar. 22-27, Bangor, Wis.—Automobile show, Auditorium; A. P. Pierce, manager.

MOTOR WORLD



The Dealers' National Weekly

Volume XLII
No. 9

New York, March 3, 1915

Ten cents a copy
Two dollars a year

SINCE January 1, 1915, we have taken orders for more than one-half as many HESS-BRIGHT BALL BEARINGS as we shipped during the entire year of 1914; *and we are delivering them, too.*

The war has not affected the delivery of bearings to us from our German factory—since the fifteenth of last September we have received approximately 375,000 bearings of assorted sizes. In addition to this we have the benefit of the constantly increasing production of our American Plant.

It is very gratifying to us to be in a position to give our customers such a concrete demonstration of our vast resources.

**THE HESS-BRIGHT
MANUFACTURING COMPANY**

Philadelphia, Pennsylvania



The Greatest Spark Plug Troubles Are Caused by the Defects That Are Not Suspected

But they mean everything to the efficiency and smooth operation of a motor.

Frequently, when motoring on a good stretch of road with the throttle opened wide a car will run smoothly enough for a mile or so but suddenly a miss is detected which increases as the motor is pushed to its maximum. Then again, while pulling up a long hill, or through a heavy road, an engine knock or miss develops which necessitates shifting to a lower gear.

NINE TIMES OUT OF TEN THE TROUBLE IS CAUSED BY LEAKY PLUGS. The metal parts in a plug expand so much more than porcelain that after a motor attains its normal heat, and is pulling under a fair load, the leakage is so considerable as to overheat the electrodes. Premature ignition develops, causing a miss and engine knock which are very detrimental to the motor.

THIS IS ONE OF THE TROUBLES THAT VERY FEW SUSPECT, and that our extensive tests have enabled us to discover.

The success of our 1915 AC TITAN AND CICO plugs and their adoption by so many of

the leading manufacturers is due to the fact that they are the most efficient plugs made.

When the car owners realize what a gas tight plug means—one that is gas tight under all conditions—they will not run their motors another day with leaky plugs.

All responsible dealers and jobbers carry AC TITAN and CICO plugs—the plugs that give results.

We manufacture the AC TITAN and CICO only. Do not be misled by a similarity of names.

Well-known Users of the AC Line

Bulck
Cadillac
Chalmers
Chase
Chevrolet
Cole
Commerce
Cartercar
Dodge Bros.
Dort
Federal
Ferro
G M C
Haynes
Harley-David-
son
Hudson
Hupp
Jackson



Well-known Users of the AC Line

Knox
Lambert
Lexington-
Howard
Moline Knight
Monroe
Moon
National
Oakland
Olds
Packard
Peerless
Paige
Reo
Saxon
Stearns
Stutz
Touraine
Vellie
Willcox Truck



**The Force of a Selling Point
is found in its truth and in its
appeal to common sense.**

*Raybestos
the product
of brake
specialists*

When we tell you that *no other concern in this country making brake lining ever has designed, developed or manufactured automobile brakes or brake mechanisms*—it is true.

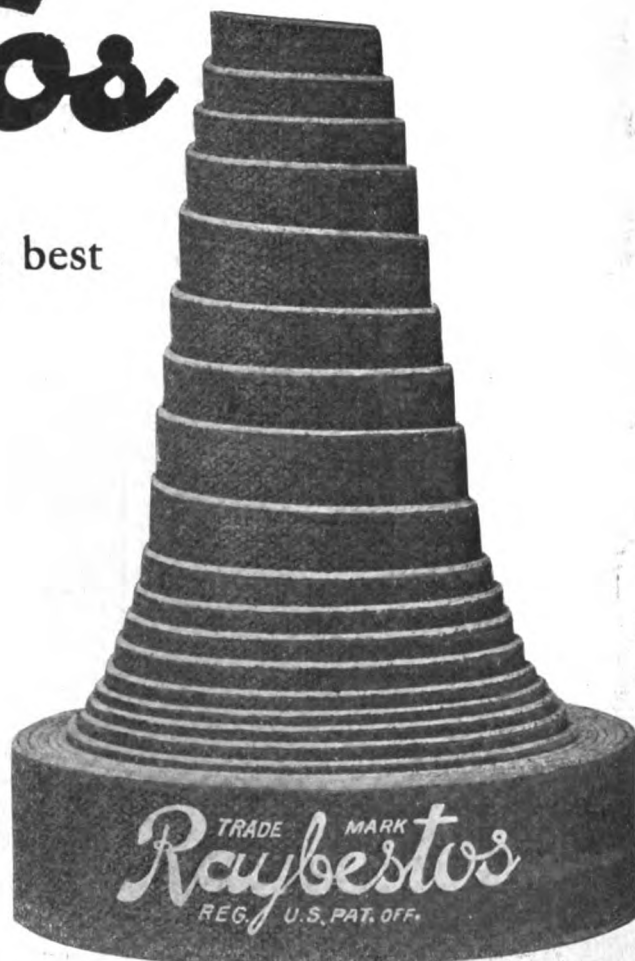
Fifteen years as designers and manufacturers of automobile brakes and brake mechanisms is the practical training which has enabled us to put the best in

TRADE MARK
Raybestos
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so that your customers will get the best out of it.

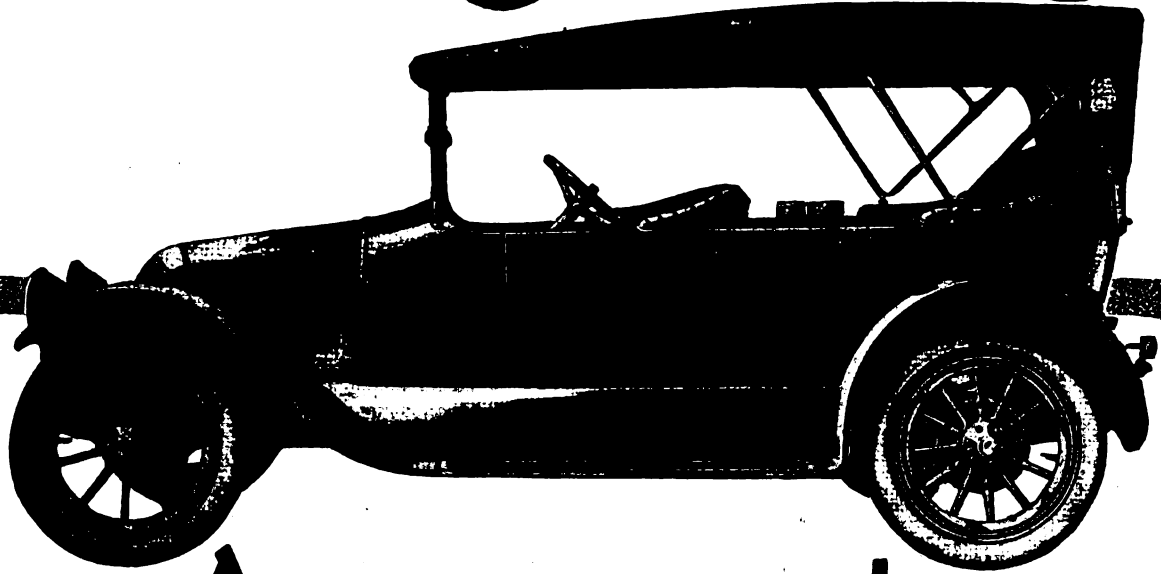
Distributed by wholesale jobbers in every large city — sold by leading dealers everywhere.

The Royal Equipment Company
1379 Bostwick Avenue, Bridgeport, Conn.



When writing advertisers please mention Motor World

The Distinctive Stewart Six



Announcement

I asked the general manager to tell me three of the principal selling points of "The Distinctive STEWART SIX". He said:

"Most cars you see on the street look alike. Lots of folks cannot tell one from another. There's a real demand for a distinctive car—a car that has some individuality. The STEWART SIX with its long, graceful, sloping hood—Renault type—is not only beautiful but distinctive.

"It's a big car, with a roomy 7-passenger body, 127-in. wheelbase, wide seats, big doors, nothing cramped or skimpy about it. It is long and rangy—low to the ground.

Standard Parts of Recognized Quality

"In designing the STEWART SIX we did not try to meet a certain determined price. We set out to build an ideal automobile and we fixed the price afterward—\$1950. We put into the car the finest kind of parts—parts of the highest grade and the best reputation.

"Any automobile engineer will tell you there is nothing better than the Continental motor, Timken axles and bearings, Brown-Lipe transmission, Gem-

mer steering gear, Fedders honeycomb radiator, Westinghouse starting, lighting and ignition. And we use all these in the STEWART SIX.

"Our body is of aluminum. Only three or four other Amer-

ican cars use aluminum bodies and they are high priced automobiles. The STEWART SIX is the most comfortable car I have ever ridden in. Its cantilever springs make the rear seat easier riding than the front seat of other cars.

Note These Amazing Specifications

Genuine Continental Motor, 6 cylinder, 44 H. P.
Westinghouse starting, lighting and ignition.
Stewart suction feed system.
Brown-Lipe transmission with Timken bearings.
Dry Plate Clutch.
Three-point suspension for power plant.
Timken front and rear axles.
Spiral bevel gears in rear axle.
Timken roller bearings throughout.
Gemmer steering gear.
Spicer tubular drive shaft.
Cantilever springs in rear.
Firestone rims and tires, 34 x 4½.
127-in. wheelbase, 56-in. tread.
Fedders honeycomb radiator in cowl.
Stromberg carburetor.
Roomy aluminum body.
Deep and luxurious upholstery.
Disappearing auxiliary seats.
Low to the ground.
Beautiful sloping hood.
All mechanical parts easily accessible and quickly removable.
Beautifully painted and finished.
All details nicely worked out.
Kellogg Power Tire Pump.
Electric horn.

Note These Many Conveniences

"Every convenience that the experienced motorist demands is found in the STEWART SIX—control instruments neatly grouped on the cowl board; gear shift and brake levers in center, well forward out of the way; left-hand steer; electric horn; Stewart speedometer geared off drive shaft; concealed heater in tonneau for winter weather; electric inspection lamp with 10 feet of cord; Kellogg tire pump; Firestone demountable rims (one extra); tool kit in front door pocket; one-man top; sliding storm curtains.

"Remember that the STEWART SIX is built by a strong organization of automobile men, who have had years of experience in building both pleasure and commercial cars."

Write Today

Our dealership proposition is exceptionally attractive. We want live dealers for the "STEWART SIX" everywhere.

Stewart Delivery Trucks

Are in use in 85 lines of business in 123 cities in the United States, Canada and South America. We do not know of one dissatisfied owner. We are greatly increasing our output for the year 1915.

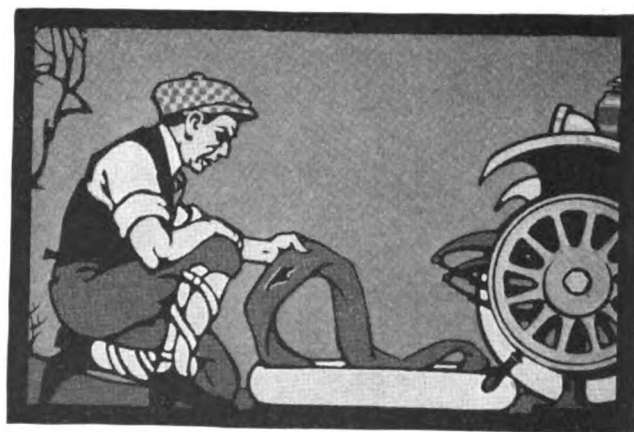
Stewart Motor Corporation

Buffalo, N. Y.

Makers of Pleasure and Commercial Cars

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Most punctures are unnecessary

Every experienced motorist knows that most punctures, so-called, are caused by faulty tubes rather than actual, accidental incision through the tire. Leakage around valves, porous rubber and worn spots are only a few of the unnecessary troubles common to cheap machine-made tubes.

The way to avoid needless punctures is to equip your car with tubes properly *made by hand out of real rubber*. *Kelly-Springfield Tubes* are made that way—and we make them slowly enough and in small enough quantity to *make them right*.

If you are tired of needless tube trouble, try them.

Kelly-Springfield Tires are made the same way. You get the result in increased mileage.

Send for "Documents in Evidence" which tells the experience of others

Kelly - Springfield Tire Company

Corner Broadway and 57th Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Kansas City, Atlanta, Akron, O.

The Hearn Tire & Rubber Co., Columbus, O.
The Southern Tire & Repair Co., Houston and Beaumont, Texas
Boger-Stiess Rubber Co., 1208 Hennepin Ave., Minneapolis, Minn.
The Boss Rubber Co., Denver, Colorado Springs and Pueblo, Colo.
The Olmsted Co., Inc., Syracuse, N. Y.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.

L. J. Barth, Rochester, N. Y.
Seifert & Baine, Newark, N. J.
Atkinson Tire & Supply Co., Jacksonville, Fla.
Central Rubber & Supply Co., Indianapolis, Ind.
C. D. Franke & Co., Charleston, S. C.
K. & S. Auto Tire Co., Limited, Toronto, Ont.
Todd Rubber Co., New Haven, Conn.
Barnard-Michael Tire Co., Buffalo, N. Y.





More Assistance For Overland Dealers

We have just published a book for farmers.

The title of this book is — “Why Do You Stay Home?”

The purpose of this book is to show the farmer what a car can do for him.

110,000 of these books will be issued.

We are sending advance circulars, advertising this book, to 825,000 farmers. We are advertising it, in the largest list of farm papers ever used by an automobile manufacturer, to 8,185,000 farmers.

Every farmer knows he wants a car. The purpose of this book is to bring home its advantages, so when he reads he will decide to buy *now*.

This book is cleverly and clearly written and profusely illustrated.

We are seeing that this book goes into the hands of the right kind of people—the people you are working on.

We follow this up with another book called “Points In Judging An Automobile.”

110,000 of these will also be distributed.

This book explains the economy and efficiency of an Overland and why the farmer should have one.

It illustrates fifty-eight definite Overland advantages.

Certainly this is *practical dealer help which no other manufacturer gives.*

Copies of above on request. Please address Dept. 50.

“Made in U. S. A.”

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

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No. 9

Pulling a Business From the Mud to a Rock

Story of an Illinois Garageman Who Found Why He Was Losing Money and How He Plugged the Leaks

"THERE! I've told you everything. Now what have I got to do?"

J. S. Joslyn's friend said nothing. He continued to look out the window of the little garage in Rockford, Ill., where Joslyn had been doing business for several years and now had reached a volume of \$75,000 annually but was making only a bare living.

Joslyn, who is the proprietor of the Joslyn Automobile Co., repeated the pleading question to this friend, who was a successful business man.

Investigation Started at Once

"Well." The friend turned from the window. "I'll look things over for you and see what we can do. When do you want to do it?"

"Any time! Right now!" exclaimed the losing garageman.

That night—this was four years ago last November—Joslyn and his friend went over the books of the business for a year—from November 1, 1909, to November 1, 1910. The result was startling. It was far into the night when the friend pushed a slip of paper across the intervening table and said:

"You have made a little money, but you have made it out of the sale of new cars. Your repair-shop has lost you \$1,800 in the last twelve months."

What Joslyn said need not be repeated. But what he did is worth telling. With the figures staring him in the face there was but one thing to do and that was make the repair-shop pay. His friends said he was making a crazy move and it was against Joslyn's own best judgment, but he got out a letter to his

customers saying he would have to

charge 75 cents an hour for labor after January 1, 1911.

Again the result was surprising. Practically all the customers said they were very willing to pay a price which would give the garageman a profit, and most of them stuck. "On those that didn't stick," said Joslyn, "I was money ahead, for I was losing money if I kept them on the old basis; but so far as I remember I didn't lose one."

Today he has one of the best garages.

repair-shops and sales businesses in the West, for it is paying a profit, every part of it; he knows today what every hour of labor costs him and he therefore knows what to charge for it; he has worked out a scrutinizing cost and accounting system which tells him everything he should know about the business, and it at once sounds the warning alarm if there is any tendency in a department to slack up in profits.

Overhead Known Exactly

He knows how few men he can have in the repair-shop and not lose money; if there are fewer than $3\frac{1}{2}$ men—which really is 4 men—the shop does not pay. And he knows his overhead, that cause of so many failures. For the last six months it has been 46 2/100 per cent on the gross.

From knowing practically nothing about his business—which was his condition four years ago—he now knows everything about the business. Having so narrowly avoided disaster with no good system, he now governs his business with a rigid system.

One of the first things he learned was he was losing from \$1.50 to \$3 a day on small parts, such as cotter pins, which were being put into cars and not charged for. This and many other leaks were stopped. Joslyn says it probably costs from \$6 to \$10 a week to run the system but that it saves from \$20 to \$30.

The cost system he has worked out centers about a 21 x 13-inch sheet which is held in a loose-leaf binder—Fig. 1. To



J. S. Joslyn, who has ferreted out the leaks in his business and turned them into profits



Joslyn has gone to considerable trouble and expense to make his establishment fireproof; among other precautions, a complete automatic sprinkler system has been installed. Each department is charged with a fixed proportion of what the proprietor has figured the yearly rental value to be and its earnings must cover this and other charges



this come all the details of the business and from it go all the bills to customers. It is the clearing house.

At the left is the date; next the customer's name; next the name of his car; next any materials which are used on the car, even to cotter pins. Next comes the date and hours worked; the Hours Charged column is to provide for time-and-a-half for overtime. Next comes what those hours cost the garageman, including wages and overhead; next comes the price the customer must pay for them, at 75 cents an hour.

Time and Material Closely Checked

Then there are recorded the actual cost and the selling price, or invoice, of the material used. All this thus far, it should be noted, is under Repair Department. Under Washing Department is recorded the washing of a car. The washer worked one hour, which cost Joslyn 25 cents and the customer was charged 60 cents. There are spaces on one side of one sheet for four departments; Joslyn carries his business in 12 departments, which are:

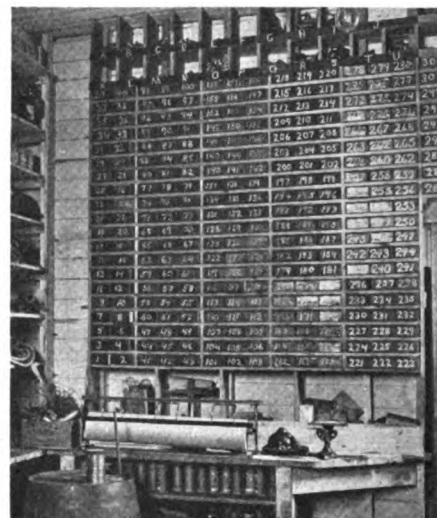
Repair	New Cars
Washing	Used Cars
Tire Repair	Livery
Tire Accessories	Live Storage
Battery	Dead Storage
Stock Room	Joslyn Chandler

The last department is a sideline which is conducted as a division of the regular business.

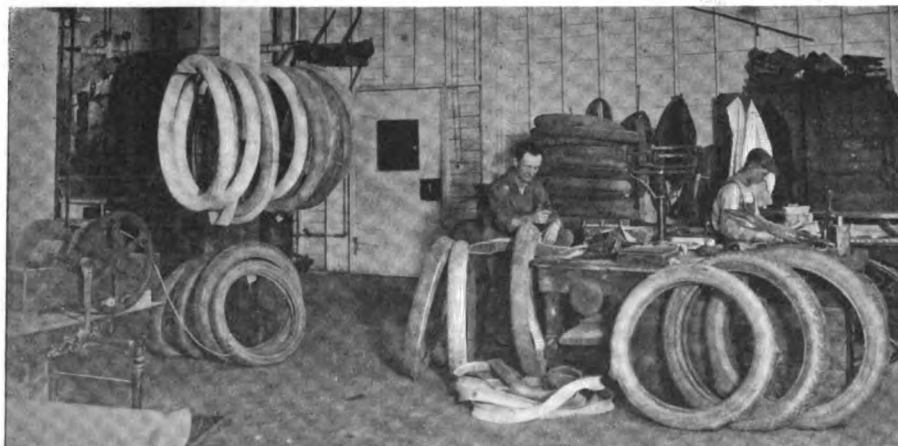
The operation of the system is best explained by following one job all the way through. John Smith, who owns a Jeffery, which is sold by Joslyn, brings his car to the garage. He says he wants the car cleaned up, a Klaxet horn put on and two Joslyn spark plugs put in place of two which are acting badly.

The car goes to the shop. Fowler,

the superintendent, turns the job over to Bennett, a workman. Bennett stamps a card—Fig. 2—on a time clock, which registers that he went to work at 4:30. He, of course, has to get that horn and those spark plugs, so Fowler fills out a



The bins and drawers in the stock room are numbered; a card index tells which receptacle a given article is stored in



The repair departments, which formerly were run at a loss, now are making money because Joslyn found out why they were losing and acted promptly to remove the causes. Both tire and mechanical repair departments are equipped to handle a wide range of work. They are kept as busy as possible, and Joslyn knows exactly how much work can slack off before the profits disappear



requisition on the stock keeper—Fig. 4. Without a requisition Bennett could not get so much as one cotter pin from the stock man.

Bennett takes the requisition to the stock man, who gives Bennett the horn and two plugs. Bennett puts them on the car and when he is done stamps the card—Fig. 2—in the Stopped Work column; he finished at 6 o'clock, which makes 1½ hours of labor.

Washing Charged According to Time

Next morning at 8 o'clock Orman, a washer, takes the job, stamping the time he started work—Fig. 3. It takes an hour to wash the car, which is shown by his stamping of the time he finished. As fast as a job is completed these cards go to the office and are entered on the sheet—Fig. 1—1½ hours of shop labor and 1 hour of washing labor. Charging for washing and polishing on an hour

card file in a little drawer and in the K's found Klaxet horn on a card—Fig. 5. This told him that they were in Bin 12, and that there were 10 in stock. It also told him when they were ordered,

plugs—gave it to Bennett, marked on the stock card—Fig. 5—at the right that February 5, 1915, on order No. 300A, he delivered one horn; he subtracts one from the 10 previously in stock, which

HOW JOSLYN DIVIDES THE RENT PER FLOOR FEET

Department	Actual Feet in Dept.	Overhead Feet Charged Against Dept.	Total Feet Charged Against Dept.	Per cent of Total Feet in Building	Portion of Rent Dept. Must Pay	Part of Bldg. Ins. and Taxes Dept. Must Pay	Machinery Insurance	Plate Glass Insurance
Repair	2,340	1,540	3,880	23.95	\$37.82	\$4.42	\$.80	....
Tire repair.....	1,665	722	2,387	14.73	23.26	2.71	.80	....
Battery repair..	300	124	424	2.62	4.14	.48	....	....
Stock room.....	577	238	815	5.04	7.96	.93	1.52	....
Storage	4,293	1,773	6,066	37.44	59.13	6.91	....	....
Office	800	331	1,131	6.98	11.02	1.29	....	....
Wash rack.....	300	124	424	2.62	4.14	.48	....	....
Joslyn Chandler	735	338	1,073	6.62	10.45	1.22	....	....
Tire stock.....	....	....	....	....	....	....	.76	....
New cars.....	....	....	....	....	....	....	....	\$.79
Total	11,010	5,190	16,200	100	\$157.92	\$18.44	\$3.88	\$.79

①		Repair		DEPT. Washing		DEPT. Tire	
BILLED	CUSTOMER	CAR NAME	MATERIAL	DATE	INVOICE	ACTUAL MATERIAL COST	INVOICE LABOR
FEB 5 1915	John Smith Jeffery	1 Klaxet Horn 2 Torsion spring plugs	2/5 1/2	60	1/13	7.00 60	10.00 2.00

②		③	
CUSTOMER	DEPARTMENT	CUSTOMER	DEPARTMENT
John Smith	Repair	John Smith	Washing
WORKMAN Bennett	NAME of CAR Jeffery	WORKMAN Orman	NAME of CAR Jeffery
Description of Work Done	Started Work	Description of Work Done	Started Work
Put on Horn on Spark Plugs FEB 5	Stopped Work FEB 5	Washing Car FEB 6	Stopped Work FEB 6

Fig. 1—The foundation of the cost system is a sheet 21 x 13 kept in a loose-leaf binder; on it all details of the business are entered and from it all bills are made. Fig. 2—Workman's time card which is stamped at the beginning and end of each job. Fig. 3—Washing and polishing cars is timed, the washer's card being stamped and the charge made according to the time

basis is regarded as the only equitable arrangement, for the man whose car is encased in mud should pay more than the man who has but a coating of dust.

To return to the stock man. When the requisition was turned in he went to a

when they were received, and how many, the list price and the cost mark. This cost mark is a code devised by Joslyn for his own information.

The stock man took out one horn—the same operation applies to the spark

leaves 9 as the stock on hand. This lower figure at the right of the card always shows what the stock on hand is. It is a perpetual inventory. In the upper right corner of this card—Fig. 5—it tells the stock man that he never should have more than 10 horns in stock and that when it gets down to the minimum of two he should order eight more. The Verification Date entry is the date on which the stock man checked his cards and counted his stock to make sure there had been no slip.

System Not Hard to Handle

The operation, of course, took less time than it takes to tell about the card. On the requisition the stock man fills in the cost mark, list price, amount and total and sends the requisition—Fig. 4

HOW JOSLYN FINDS THE RENT HIS BUSINESS MUST PAY

6% interest on land and building valued at \$21,000.....	\$1,260.00
3% depreciation on building valued at \$12,500.....	375.00
2% depreciation on sprinkler system costing \$1,350.....	27.00
20% depreciation on plumbing costing \$247.....	49.40
5% depreciation on cold water pipes costing \$90.....	4.50
10% depreciation on heating system costing \$1,400.....	140.00
5% depreciation on telephone system costing \$90.....	4.50
5% upkeep on elevator costing \$448.87.....	22.44
5% upkeep on electric wiring costing \$245.....	12.25

Total annual rental.....	\$1,985.09
Monthly rental.....	\$157.92

Form No. 102-10m-11-14

STOREKEEPERS ORDER FOR MATERIAL

Please furnish bearer B.B. Bennett Date Feb 5, 1915 N^o 300 A

Car Jeffery Charge to John Smith

QUANTITY	ARTICLE	PRICE PER DOZEN	COST MARK	LIST PRICE	AMOUNT	TOTAL
2	Joslyn spark Plugs	2A	1.00	2.00		
	Klaxet Horn	YAL	10.00	10.00		
					12.00	

(4)

ARTICLE Klaxet Horn VERIFICATION 1-15-15 MAXIMUM 10

LOCATION Bm 12 MINIMUM 2

UNIT

ORDERS PLACED			RECEIVED			LIST PRICE		PER DOZ.		ISSUED		BALANCE ON HAND	
DATE	REQ. NO.	QUANTITY	DATE	REQ. NO.	QUANTITY	COST MARK	PER L.B.	DATE	ORDER NO.	QUANTITY	BALANCE ON HAND		
10/24	346	10	10/24	346	10	YAL	10.00	2/5	30A	1	9		

Signed Foucher

(5)

Fig. 4—Without an order for material a workman cannot get so much as a cotter-pin. Fig. 5—The stock card is a perpetual record of stock on hand and sold and carries all the details

—to the office, where the horn and two plugs are charged against Smith on the sheet—Fig. 1.

The job is completed and the car is ready for delivery. The office girl copies the data off Fig. 1 and bills Smith

over the departments, and the way this is done is interesting, too. First, the rent is divided by 12, which gives a monthly rental of \$157.92, which is in turn split over the departments. Each department carries rent in proportion to

overhead space is divided according to the actual feet in the department.

Salaries are prorated over the departments according to the extent to which the man's time is devoted to each department. Purchases of materials, of course, are charged against the department for which purchased, and any other items are split up on an equitable basis.

Personally Solicits Repair Business

In figuring overhead the overhead for the month preceding helps fix the overhead for the present month. Knowing the overhead percentage and desiring a certain profit, the cost is increased by both these and the invoice figure is obtained. It should be explained that to obtain a profit of 25 per cent on the gross, $33\frac{1}{3}$ per cent must be added to the cost. Thus, $33\frac{1}{3}$ per cent of a \$3 cost is \$1; \$3 plus \$1 is \$4; a profit of \$1, 25 per cent of \$4, the selling price.

Under this system Joslyn is able to spend several hours a day outside the office without affecting the business.

During the fall he spent much time outside soliciting repair business. Therefore, when the touring season began to

(7) Pay Roll Ending January 31 1915

NAME	No.	Dept.	S	M	T	W	T	F	S	S	M	T	W	T	F	S	Hours	Total Hrs.	Rate	10A	10C	4C	2C	2A	4A	10A	10C	4C	TOTAL
E.D. Foucher	2C																2 1/2	18.75											
	4C																1	7.50											
	10A																3	22.50											
	10C																3	22.50											
J.A. Johnson	2A																3	22.50											
	4A																1	7.50											
	10A																3	22.50											

Fig. 7—Each department has a number. A means administrative labor, B productive labor, C unproductive. Thus, "Johnson, 10A, 3 hours," means that Superintendent Johnson devoted 3 hours of administrative work to car repairs, which is Department 10. Pay-days are the 2nd, 9th, 17th and 24th, making four a month. The double-week on the above sheet provides for a week which does not therefore start on Sunday.

according to Fig. 6. The original is Smith's statement; a yellow carbon copy is filed loose leaf and these constitute the Day Book. Each carbon bears a number and the names are indexed alphabetically in the front of the Day Book, followed by the index numbers.

The totals are posted to the Ledger, with the Day Book serial numbers.

As stated, Joslyn knows the actual cost of operating each department and bases his charges on cost plus overhead plus profit. His method is interesting.

As a starter, he figures out a rent. He owns the building and the real estate, but the money invested in them is not earning anything if the business is not made to pay something therefor, so Joslyn figures out what he terms rent.

This means that every month the business must pay back this much as rent to give a return on the investment and provide for upkeep and repairs; the telephone system on which depreciation is charged is an interdepartmental system owned by the company.

The next step is to divide this rent

the square feet of floor space it occupies. But there is space for driveways and odd corners which does not belong to any department, so this is totaled and this

close he began a campaign in person to get cars in for their winter overhauling. With winter work thus secured an even force is carried.

(6) JOSLYN AUTOMOBILE CO.

Manufacturers and Jobbers

Both Telephones 1004

J. S. JOSLYN, Pres. & Manager

ROCKFORD, ILL., Feb. 6, 1915

Sold to John Smith Order No.

Address City Terms

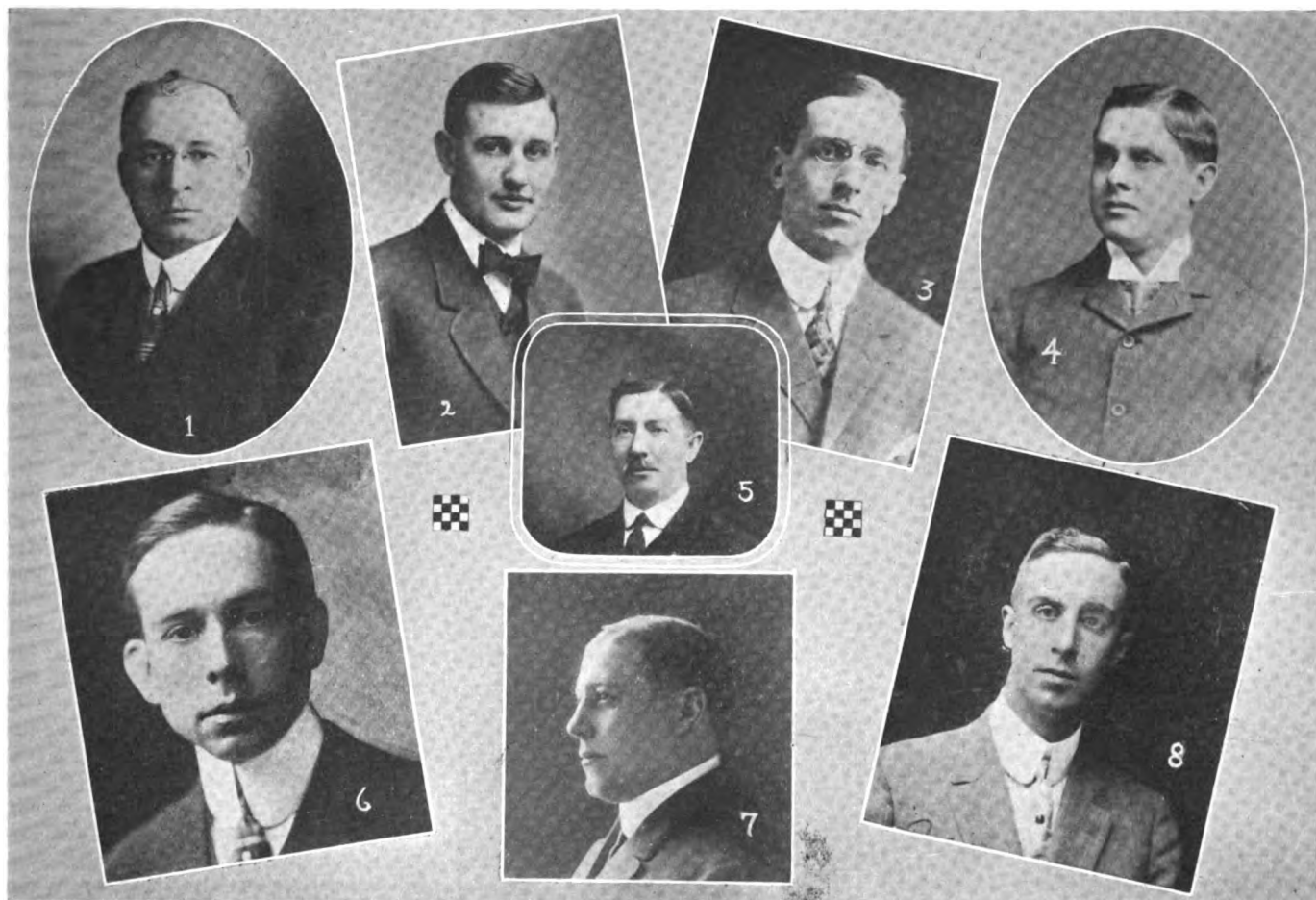
Shipped to Via

2/6 - 1 1/2 hrs. labor	1.13
1 Klaxet horn	10.00
2 Joslyn Special spark plugs	2.00
1 hr. washing car	.60
	<u>\$13.73</u>

JEFFERY 4

THE ONLY GARAGE IN ROCKFORD PROTECTED BY AUTOMATIC SPRINKLERS

Fig. 6—Statements are made out in duplicate; the original goes to the customer and a yellow duplicate is filed loose leaf. The duplicates constitute the Day Book



OFFICERS AND DIRECTORS OF THE SYRACUSE AUTOMOBILE DEALERS' ASSOCIATION. 1—S. Silverman, Jr., vice-president; Syracuse Motor Car Co. 2—Harry T. Gardner, business secretary and show manager. 3—George H. Norris, treasurer; Genesee Motor Car Co. 4—B. W. Moyer, director; H. A. Moyer & Co. 5—W. R. Shaw, director. 6—John W. Lee, Jr., president; Overland Syracuse Co. 7—T. G. Meachem, director; Palmer-Moore Co. 8—T. A. Young, secretary; Bull & Young

Syracuse Show Indicates 75% Gain for 1915

Central New York Dealers Are Opening a Good Year—Prospects Through Whole Territory Excellent

AN increase of 75 per cent in business for the coming year as compared with 1914, summarizes the statements of the dealers who exhibited last week at the seventh annual show of the Syracuse Automobile Dealers Association in the State Armory, Syracuse, N. Y. The increase sounds like exaggeration, but the dealers who furnished the figures could in many cases cite 1915 sales which at this season of year were already equal or nearly equal to the total 1914 business.

The territory—which embraces ten and often more counties—should this year buy 3,500 cars, as compared with less than 2,000 last year, and the total business in cars and allied products should be close to \$5,000,000.

Some of the increase is due to new business created by new cars, such as Briscoe, Dodge Bros. and Inter-State.

the creation of new agencies, and the increased popularity in certain lines due

POPULATION OF CITIES IN SYRACUSE TERRITORY

Auburn	34,668
Binghamton	48,443
Elmira	37,176
Syracuse	137,249
Watertown	26,730
Cortland	11,504
Oneida	8,317
Rome	20,497
Utica	74,419
Fulton	10,480
Oswego	23,368
Ogdensburg	15,933
Ithaca	14,802
Total	463,586

to lower prices and attractive product.

The show was the most successful ever held, and was so much so that whereas it ran but five days this year it will be a full six-day show in 1916.

One of the unique features of the show was the used car exhibit. The basement of the Armory was given over to used vehicles; while signs were forbidden in the main show they were permitted in the used car exhibit, and each car carried a pretty placard, telling what the car was and generally the price. Most prices were quite reasonable. Twenty-six used cars were shown and quite a few sales were made.

At previous shows the man who did not seem desirous of paying the price of a new car and who dropped a hint that he might buy a used car had to be taken to the dealer's salesroom, where the car was shown often in unfavorable sur-



SIX OF THE SYRACUSE DEALERS AT THE SHOW. 1—George W. Bartlett, Bartlett & Smith Motor Co.; Studebaker. 2—Chester D. Fuller, Woods Mobilette. 3—H. J. Thomas, Syracuse Rubber Co.; manager of Accessory Department. 4—E. L. Rolfson, Service Boat & Engine Co.; Inter-State. 5—E. A. Hoffman; manager Syracuse branch of Firestone Tire & Rubber Co. 6—Edward A. Ross; Syracuse Buick Sales Co.

roundings. The often chilly trip to the salesroom served to dampen the prospect's ardor. But with the used cars in the basement the man who was at all interested was immediately escorted downstairs, where there were better possibilities of closing the sale than under the old arrangement. All the cars were of good appearance, many of them having been overhauled and repainted. It was on the whole an attractive display and a creditable merchandising idea which is worthy of emulation.

The Syracuse show is the main motorizing event in Central New York. March 3-6 Watertown holds a show in the State Armory in that city, and the week following Utica has an exhibition, but the Salt City event is the largest.

The total population in the Syracuse territory is about 1,000,000, about half of which is in cities of more than 10,000 population. The remainder is made up of farmers and residents of the countless villages which dot the territory.

The importance of Syracuse as a car distributing center was more than ever emphasized by the show. During the five days 21,000 people passed through the gates; 600 dealers from the whole territory visited the show, and the exhibit was attended by numerous factory representatives who have their eyes on Central and Northern New York for the coming season.

Buffalo and Rochester, both of which

are larger than Syracuse, do not cover so great a territory as the Salt City. They cannot, because they are geographically restricted. Lake Ontario hems them in at the north; Buffalo can extend its lines of distribution only southward and eastward because of Lakes Erie and Ontario, and cannot reach far



1—Stewart W. Munroe, manager of the Central City Auto Co., Maxwell and Detroit. 2—W. C. Blake, Goodyear Tire & Rubber Co.

eastward before it begins to encroach upon Rochester territory. Similarly, Rochester cannot reach far except to the south, for it is hemmed in on both sides by Syracuse and Buffalo territory.

But Syracuse can reach much farther. Its business fingers extend 130 miles to the north, over Watertown and Ogdensburg and to the Adirondack watershed and the St. Lawrence river; it reaches to Oswego and Lake Ontario; westward

half way to Rochester, into the rich apple farming and industrial country; southward the boundaries of the Syracuse distributing dealers are variant; in some cases the line does not include Binghamton, but in other cases the territory cuts a wide swath southward to the Pennsylvania-New York state line and takes a section out of the Keystone State.

What is most commonly recognized as the Syracuse territory includes the counties of St. Lawrence, Jefferson, Lewis, all or part of Oneida, Cayuga, Onondaga, Madison, Tompkins and Cortland, but in quite a few cases it is extended to cover also part of Wayne, Seneca, Schuyler, Chemung, Tioga, Broome, Chenango, and Bradford county, Pa. It is an elongated pyramidal territory 230 miles long, terminating in a point at the north and 100 miles wide at the base.

In this territory are, besides Syracuse, the cities of Auburn, Binghamton, Elmira, Ithaca, Cortland, Oswego, Watertown, Ogdensburg, Oneida, Rome, Fulton and Utica, although Utica is generally the base of a territory of its own and distributes over a radius in all directions, running, however, not far toward Syracuse.

Syracuse is the logical distributing point for this territory, lying at almost the geographical center of the state and being the largest city in the central por-



SIX MORE SYRACUSE DEALERS. 7—Frank L. Wightman, Wightman & Rich Co.; Winton and Haynes. 8—F. L. Allen; manager of the Syracuse Branch of the J. I. Case T. M. Co. 9—W. L. Van Dyke, and (10) F. A. Van Dyke, Van Dyke Bros.; Mitchell. 11—H. T. Boulden, sales manager of the Chase Motor Truck Co. 12—Harry N. De Witt, manager of the Reo Sales Co.



SIX OF THE MEN WHO SELL CARS IN CENTRAL NEW YORK. 1—I. R. Gardinier, Utica; Buick. 2—Floyd H. Newton, Newton Motor Car Co., Chittenango; Ford. 3—F. B. Petrie, Oneida Motor Car Co., Oneida; Buick, Maxwell and Saxon. 4—Lewis E. Springer, Auburn; Hudson and Overland. 5—T. F. Fitzpatrick, Utica; Overland. 6—Ward P. Smith, Watertown; Studebaker

tion, possessed of good transportation facilities and well equipped for the work. It lies on the main line of the New York Central Railroad, from which branches run north in several directions. Southward the Lackawanna is the artery of traffic; other lines reach to the southeast and southwest, and north, east, west and southwest are modern electric roads which annually carry thousands of people from a radius of from 40 to 60 miles to the markets in Syracuse.

York the great variety of manufacture preserves an evenness of condition.

In the cities of the territory are nearly 2,000 factories which, according to the census figures of 1909, produced to the extent of \$145,000,000; but in the five intervening years the whole section has progressed, which makes this 1909 figure conservative.

Each city has many kinds of manufacture; the principal branches in the principal cities are: Binghamton, to-

to the wealth of these cities and are to an extent buying powers.

Agriculture furnishes the price of about 40 per cent of the cars which are distributed through Syracuse dealers. As in manufacturing, the products are varied. In the north counties hay and timber are leading lines; along the south shore of Lake Ontario is one of the greatest fruit countries in the United States; Central New York raises hay, grain and foodstuffs; hops are a big item to the southeast; cabbages have been made a leading product in the immediate south, but through all the counties there are other and varied products which make the farmer a potential motor car owner.

Fifty Thousand Farms

And, as in other sections, the farmer is buying cars; he has waked up to the fact that he is able to own a car and that life is much more enjoyable if the farm equipment includes a motor vehicle. The wealth of the farmer in the ten counties which are most properly termed the Syracuse territory—that is, the value of the farms and equipment only—is now nearly \$300,000,000. There are nearly 7,000,000 acres of farm land divided into 50,000 farms, averaging 133 acres to the farm.

This value of the farms and equipment does not include the wealth of the farmer; it is only his working "machinery." His bank roll is not included in the statistics.

The allotment of territory to the Syracuse dealers ranges from Onondaga county, in which Syracuse is located, to

STATISTICS OF THE FARM PROPERTY IN 10 COUNTIES OF THE SYRACUSE TERRITORY

County	Population	Acreage	No. Farms	Average Acreage	Value of All Farm Property
St. Lawrence	89,005	1,728,640	8,244	129.1	\$49,975,175
Jefferson	80,382	815,360	5,778	126.8	40,095,331
Oswego	71,664	618,240	6,319	77.9	23,804,151
Lewis	24,849	812,800	3,343	142.1	16,188,674
Oneida	154,157	800,000	6,929	99.6	38,437,991
Madison	39,289	416,000	4,042	94.4	20,891,990
Onondaga	200,298	499,840	5,770	75.8	37,291,043
Cayuga	67,106	449,920	4,785	85.9	26,915,448
Cortland	29,249	321,920	2,610	114.8	13,171,013
Tompkins	33,647	304,640	2,988	91.4	14,898,795
Total	789,646	6,767,360	50,808	133	\$281,769,611

Two main groups, evenly divided in importance, constitute the buying power of the territory—agriculture and manufacture. The cities are without exception manufacturing cities, and the health of the industry of this part of the state is directly attributable to the varied and numerous factories; when a community depends upon one large industry its condition is that of this industry, which is well illustrated in Elgin, Ill., and its watch works; when the watch works slowed down several months ago the city felt it keenly, but in Central New

bacco; Auburn, agricultural implements, cordage and twine; Rome, brass and bronze products; Oswego, matches and starch; Watertown, foundry and machine products; Fulton, worsted goods; Cortland, iron and steel, steel works and rolling mills; Ogdensburg, lumber and timber products, flour and grist mills; Ithaca, printing and publishing; Syracuse, iron and steel products, typewriters, clothing, alkaline products, motor cars and other vehicles. Also, in Ithaca is Cornell University and in Syracuse Syracuse University, which add not a little



DEALERS FROM NORTHERN NEW YORK WHO ATTENDED THE SHOW. 1—A. W. Reynolds, Pulaski Auto Supply & Garage Co., Pulaski; Overland. 2—John S. Bough, Oswego; Studebaker. 3—George Lloyd, Oneida; Studebaker. 4—A. D. MacIntyre, Oswego; Ford. 5—D. D. Norton, Cazenovia; Overland. 6—John C. Taylor, Mexico; Ford



DEALERS FROM THE CITIES IN THE SYRACUSE TERRITORY. 1—W. D. Evans, Ogdensburg and Hammond; Buick. 2—George H. Leonard, Auburn; Franklin. 3—Walter D. Briggs, Homer; Overland. 4—George H. Ames, Cortland; Ford. 5—W. E. Jordan, Oswego County Auto Co., Mexico; Reo. 6—C. A. Wadsworth, Skaneateles; Overland. 7—P. R. Keating, Keating Garage, Oswego; Buick. 8—W. L. Gould, Watertown; Buick

the list of from 10 to 15 which lie about this city. Subdealers are, of course, employed in a majority of cases, although H. E. Stowell, who has the Packard; A. A. Ledermann, of the Pierce-Arrow, and F. H. Johnson, Locomobile, do not rely upon subdealers in handling these cars. The high-priced car is regarded as unsuited to the business of the small town dealer. His sales necessarily would be few each season, and unless he had other lines to fill in his profits would not be large. In fact, he might not make a single sale in a whole season unless there were in his community an unusual proportion of wealthy men.

No "Subs" on High-priced Cars

Therefore, the higher-priced cars are sold directly by the Syracuse dealers; if a prospect appears anywhere in the territory the Syracuse dealer goes to him and makes as many trips as are necessary, besides using the usual circularizing method. While it might be expected that a dealer such as Stowell, who him-

self handles the Dodge, Hudson and Packard, might rely upon a subdealer in these lower-priced cars to keep an eye on the Packard business as well, the subdealer is not asked and is not expected to give much thought to the higher-priced cars. Stowell considers that he can well take care of it himself, and in a better way.

The largest territory is allotted to the dealers in the medium-priced cars, such as Hudson, Cadillac, Hupmobile, Paige and Chandler. These distributors have as many as ten counties and parcel out the business through subdealers in a half dozen principal cities. In the Hudson, Stowell has seven subdealers; the Wightman & Rich Co., with the Winton and Haynes, has two counties and no subdealers; Charles G. Hanna, of the Chalmers Syracuse Co., has eight counties with the Chalmers and Hupmobile and employs four Chalmers subdealers and eight on the Hupmobile.

Half Million a Year

One of the small territories is that of S. Silverman and David Grody, proprietors of the Syracuse Motor Car Co., who claim to have the oldest dealership company in the city. On the Paige they have eleven counties, but on the Ford they have but Onondaga. Yet in this one county they have subdealers in Elbridge, Skaneateles, Camillus, Lysander, Baldwinsville and Fabius, all villages within a small radius. Their business last year was better than \$500,000, showing the tendency of the farmer to purchase smaller cars. Grody stated that while 40 per cent of their Paiges went to the rural population, the farmers buy 65 per cent of the Fords sold.

One of the biggest distributing houses in Syracuse is the branch of the J. I.

Case T. M. Co. This was established several years ago when the Harrisburg, Pa., branch, which handled that territory, became unable to care for all the business. The New York city branch handles part of the territory near the metropolis, but the Syracuse branch cares for 149 dealers. Some of them do a remarkable business; the Brier Hill man in Northern New York has sold \$43,000 worth of Case cars and implements in 2½ years.

Cover Several Cities

A. A. Ledermann is the proprietor of salesrooms for the Pierce-Arrow in both Syracuse and Utica. Another who works more than one city is A. M. Zimbrich, who covers Rochester, Syracuse and Utica. He has the Maxwell in Central New York and the Detroit in the three cities and adjacent territory. C. H. and G. H. Norris, of the Genesee Motor Car Co., Cadillac, have a territory which includes Bradford county, Pa.

Enclosed cars are not making great progress; the preference of the Central New York buyer seems to be for a touring car—or a roadster. The utilitarian spirit of industrialism seems to permeate the car owners of the territory, and they do not lay their cars up during the winter; probably 40 per cent of the cars are kept in service when the streets are at all passable, and not many of the cars are of the enclosed type. A touring car, curtained if the weather is wintry, suffices, and the owners, most of whom drive their own cars, seem to feel no discomfort whatever.

The temperature during the winter seldom averages far below freezing, and for days at a time it is comparatively mild; of course, in the northern counties, near

(Continued on page 16)



DURING THE SYRACUSE SHOW, REPRESENTATIVES OF THE COLE MOTOR CAR CO., INDIANAPOLIS, DROVE A COLE UP AND DOWN THE ENTRANCE STEPS TO THE SYRACUSE UNIVERSITY STADIUM AS A DEMONSTRATION. FOLLOWING IT, NICHOLS, NICHOLS & NICHOLS SIGNED FOR THE AGENCY. THOSE IN THE CAR ARE: 1—F. J. Nichols. 2—F. H. Nichols. 3—Charles J. Nichols, all of Nichols, Nichols & Nichols. 4—W. T. Butler, Indianapolis; eastern representative of the Cole Motor Car Co. 5—E. H. Baker, president of the Cole Motor Car Co. of Buffalo. 6—James Sullivan, Geneva, N. Y.; Cole dealer



Resta Takes Grand Prize at 57-Mile Pace

Peugeot Driver Wins Spectacular Race in 7:07:57—Wilcox, Stutz, second; Hughes, Ono, third; Anderson, Stutz, fourth—Shortest Grand Prize Course a River of Mud—Heavy Rain Bothers the Drivers.

Driving a heady race in the face of frightful odds, Darius Resta, at the wheel of a Peugeot, on Saturday won the Grand Prize race run over the Exposition course in connection with the Panama-Pacific International Exposition in San Francisco. Resta's time was 7:07:57, which figures out at 56.12 miles an hour. Howard Wilcox, driving a Stutz, was second in 7:14:36, and Hughie Hughes, in an Ono, was third in 7:21:46. The story of those who won and those who fell by the wayside is given in the appended table.

Slipping and sliding and throwing up clouds of spray so dense that at times the cars were obscured, the race was by far the most spectacular that has ever been run for the Grand Prize. The course surveys 3.8489 miles to the lap, and therefore is the shortest over which the Grand Prize has been run. Almost from end to end it was a mire of mud and water, and it is significant that when Resta had completed his 104 laps there remained

but 12 cars on the all but submerged course.

Most of the race was driven in a driving rain, which made the asphalt portion of the course dangerous and flooded under the planked section until the pounding of the wheels shot miniature geysers from each crack.

Favorites Quit Early

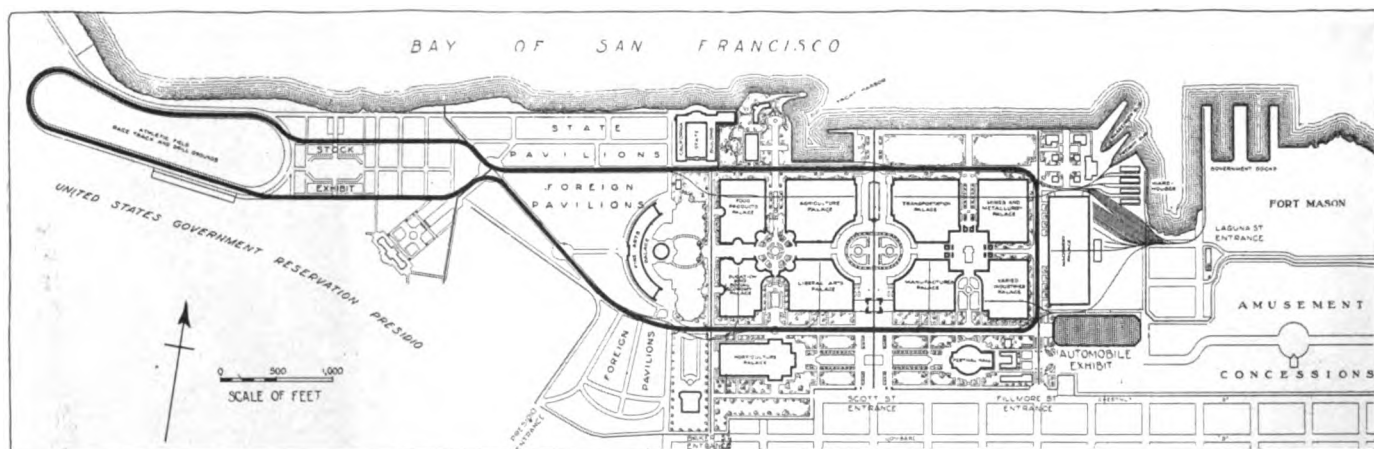
De Palma quit in the 67th lap because of the condition of the course and was soon followed by Pullen, winner of the 1914 Grand Prix. Several pit managers signalled to their drivers to slow their pace and take no unnecessary chances; others called their men in.

Resta drove a consistent race. He gained his lead in the first lap and retained it throughout the race with one exception. From the 35th to the 45th lap Hughes in the Ono led him by a minute and a fraction. Until after the 80th lap Hughes was a possible contender for first money, but after the 80th

the race was between Hughes and Wilcox in the Stutz for second.

Hughes led Wilcox by a lap and a half until the 94th lap and was favorite for second money. Then checkers suddenly missed Hughes' green gold-banded car. In a few minutes the reason was apparent. Earl Devore, Hughes' mechanic, was seen coming on the run for the pit signalling wildly for gasoline. The tank had gone dry and the car was stalled a quarter of a mile from the pit on the opposite side of the track. Devore got his gasoline to the car and an attempt to catch Wilcox in the Stutz was begun. But the misfortune of Hughes gave Wilcox his chance and brought him second money, with Hughes landing third. That can of gasoline cost Hughes just \$500.

Fourth and fifth places were uncertain until the beginning of the last 20 laps. Before this time, Carlson, the only survivor of the Maxwell team, was running a strong third to fourth. He began to



The course over which the race was run is almost wholly within the Exposition grounds and is the shortest that has ever been used for the Grand Prize; it measures 3.8 miles to the lap, and the race went 104 laps

lose time after the 75th lap, however, and by the 80th lap was clearly out of the money. It was then that Anderson loosened up his Stutz and made Disbrow with his Simplex drop back into fifth place. Disbrow followed in Anderson's spray for 10 laps and then started to open up. From the 95th lap until the finish he bettered his competitors' time, exceeding it at the finish by over three minutes.

Cars Hidden By Spray

The withdrawal of the veteran De Palma because of the danger of the course is fact enough to describe the condition of the track. At times the cars and drivers were completely hidden from view by the spray and mud. Cars swished, swung and skidded with crazy gyrations that made the spectators gasp.

It was nothing short of miraculous that no accidents occurred.

The drivers all complained of terrific headaches, caused by the rain beating in their eyes. In several instances mechanics and drivers, too exhausted to stand the strain, had to be removed and fresh men put in. Some were hardly able to lift themselves from the cars and had to be supported to the pits. A frequent signal flashed from the pits was instruction to the mechanics to hug the drivers to keep them warm. Fred McCarty, Resta's assistant, attempted in every way to keep his driver warm, and Resta gives him much credit for the victory.

Oldfield's Popularity Lives

All three favorites of the day went out early in the race. Barney Oldfield, the

Western favorite, was repeatedly cheered as he splashed by the grandstand. When he drove to his pit almost before the race had started it was thought that he would soon be back in the game, but his car was beyond repair. De Palma and his "safety first" withdrawal was received with some disappointment, but with little comment. Pullen dropped out immediately after De Palma, and from then on interest centered on Hughes.

Resta's First American Race

Until today Resta was unknown in America. This was his first race on American heather, but he has had much experience in England and drove last year in France in the Grand Prix.

In a few words, the Grand Prix was a terrific mud-fest, a race of endurance by daredevils.

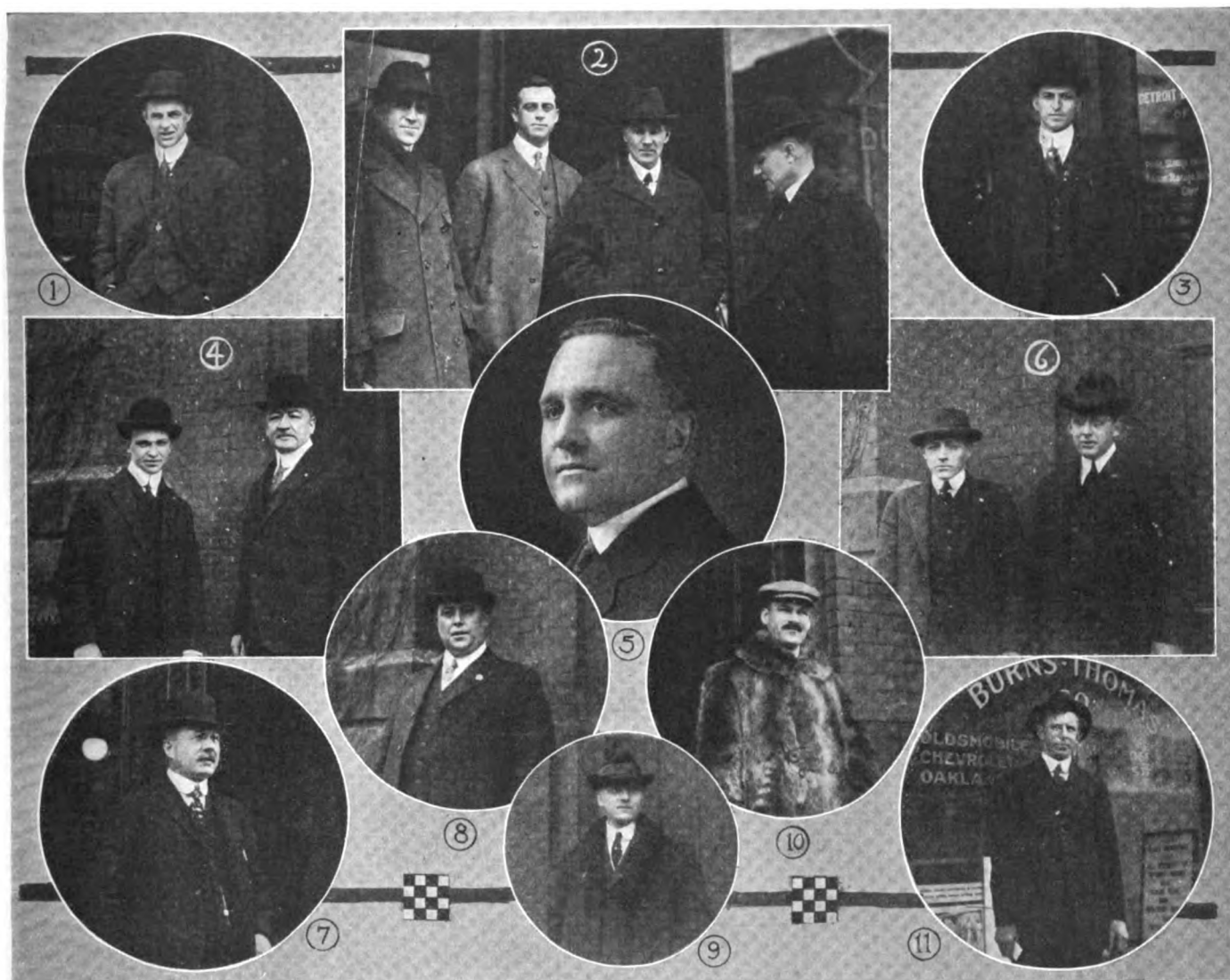
THOSE WHO WON AND THOSE WHO FAILED AND THEIR EQUIPMENT

Driver	Car	Time	Avg. Lap	Carburetor	Magneto	Plugs	Tires	Oil	Wheels
Resta	Peugeot	7:07:57	56.12	Master	Bosch	Bosch	Nassau	Oilzum	Rudge-Whitworth
Wilcox	Stutz	7:14:36	55.26	Schebler	Bosch	Bosch	Silvertown	Monogram	Houk
Hughes	Ono	7:21:46	54.37	Master	Bosch	Bosch	Firestone	Oilzum	Wood
Anderson	Stutz	7:31:38	53.15	Rayfield	Bosch	Bosch	Silvertown	Monogram	Houk
Disbrow	Simplex	7:34:51	52.79	Rayfield	Bosch	Bosch	Silvertown	Oilzum	Rudge-Whitworth
Nikrent	Mercer	Flagged	99	Rayfield	Bosch	Bosch	*	Oilzum	Rudge-Whitworth
Grant	Case	Flagged	98	Master	Bosch	Bosch	Silvertown	Texaco	McCue
McKelvy	Overland	Flagged	94	Schebler	Bosch	Bosch	Fisk	Autoline	Houk
Kennedy	Edwards Sp.	Flagged	90	Master	Bosch	Bosch	Silvertown	Motoreze	Houk
Gable	Tahis	Flagged	89	Master	Bosch	Bosch	Michelin	Oilzum	Wood
Newhouse	Delage	Flagged	89	Master	Bosch	Bosch	Firestone	Motoreze	Rudge-Whitworth
Durant	Chevrolet	Flagged	87	Master	Bosch	Bosch	Nassau	Oilzum	Houk
Taylor	Alco	Flagged	82	Master	Bosch	Bosch	Hendrie	Havoline	Houk
Carlson	Maxwell	Out	94	Harroun	Bosch	Bosch	Silvertown	Oilzum	Houk
Alley	Dusenber	Out	88	Master	Bosch	Bosch	Riverside	Oilzum	Wood
Lecain	Chevrolet	Out	80	Master	Bosch	Bosch	Nassau	Oilzum	Houk
Pullen	Mercer	Out	72	Rayfield	Bosch	Bosch	Silvertown	Oilzum	Rudge-Whitworth
De Palma	Mercedes	Out	64	Rayfield	Bosch	Bosch	Nassau	Monogram	Rudge-Whitworth
Hearne	Case	Out	65						
Ruckstall	Mercer	Out	64	Rayfield	Bosch	Bosch	*	Oilzum	Rudge-Whitworth
Parsons	Parsons Sp.	Out	59	Master	Bosch	Bosch	Firestone	Oilzum	Wood
O'Donnell	Dusenber	Out	58	Master	Bosch	Bosch	Riverside	Oilzum	Houk
Klein	King	Out	48	Rayfield	Bosch	Bosch	Firestone	Oilzum	Rudge-Whitworth
Rickenbacher	Maxwell	Out	44	Harroun	Bosch	Bosch	Nassau	Oilzum	Houk
Bragg	Californian	Out	33	Rayfield	Bosch	Bosch	*	Oilzum	Rudge-Whitworth
Oldfield	Maxwell	Out	29				Firestone		
Gandy	Edwards Sp.	Out	23	Master	Bosch	Bosch	Silvertown	Motoreze	Houk
Marquis	Bugatti	Out	10	Master	Bosch	Bosch	Hardman	Oilzum	Rudge-Whitworth
Cooper	Stutz	Out	4	Schebler	Bosch	Bosch	Firestone	Motoreze	Rudge-Whitworth

* Palmer and Silvertown.

New Haven's Business Totals \$2,700,000

Despite Small Territory Dealers Expect to Distribute More Than \$4,000,000 Worth of Cars This Year—Electrics Increase



SOME OF THE DEALERS WHO PEOPLE NEW HAVEN'S ROW—

(1) George A. Chisholm (Metz); (2) Duttee W. Flint's Ford organization, left to right, George D. Ford, salesman; John P. Shea, floor salesman; H. M. Buzzard, New Haven manager; Benjamin Peckham, in charge of Connecticut territory; (3) H. C. Snyder, manager, Detroit Electric Car Co.; (4) left, G. P. Webber (Haynes and Allen); right, W. P. Mallon,

eastern representative Allen Motor Co.; (5) W. A. Rutz, general manager, White Motors Co.; (6) left, R. H. Mulch, Reo Motor Car Co.; right, J. M. Henry, East Rock Garage (Mitchell); (7) M. L. Biever, Biever Motor Car Co. (Maxwell); treasurer, New Haven Automobile Trade Association; (8) L. F. Feltis (Studebaker); (9) C. O. Reichert (Moon and Reo); (10) N. B. Whitfield (Overland); (11) W. H. Thomas, Burns-Thomas Co. (Oldsmobile, Chevrolet and Velie)

IN that part of New England which centers around New Haven, Conn., motor car dealers last year sold cars to the value of \$2,796,000, and for the current year conservative estimates place the total volume of sales at approximately \$4,000,000. Although these amounts may seem small by comparison with the totals that are piled up by such great distributing centers as Kansas City, Omaha and Minneapolis, where dealers have hundreds of thousands of square miles of territory to draw from,

it must be remembered that the territory which is covered by New Haven dealers is almost microscopic by comparison.

The average New Haven dealer calls as his territory an area which does not exceed 1,500 square miles. In this territory there is a possibility that he may sell 1,037,000 persons. This is made up of New Haven, Fairfield and Middlesex counties, the respective population figures being 337,000, 45,637 and 245,352. But not every dealer has these three

counties in which to sell cars. Only the larger dealers can place their agents in these counties adjoining New Haven. The smaller dealers must be content with New Haven county, including the city of New Haven, with a population of 144,500, and perhaps a small part of Fairfield and Middlesex counties. In some few instances the larger dealers have the whole of the State of Connecticut for territory.

The extent of the territory controlled by the average New Haven dealer can

be judged from the statement that as a rule the eastern boundary is the Housatonic river and the western boundary the Connecticut river. To the south there is Long Island Sound and the boundary on the north side does not extend much beyond a straight line drawn through the cities of Waterbury and Meriden.

New Haven Fertile Field

The city of New Haven itself is the most fertile soil for the New Haven dealer, for though it is comparatively small in area, containing but 22½ miles, the population is concentrated. For example, both Holyoke, Mass., and Portland, Me., are almost identical in area with New Haven, yet the population figures are but 65,000 and 63,000, respectively. Hence, it is not to be wondered that the proportion of sales made by the New Haven dealer to inhabitants of the city is comparatively large, varying from 60 to 80 per cent.

As a matter of fact, most dealers concentrate their selling efforts on New Haven itself, few of them having more than three or four subdealers in other cities in their territory. That there is room for considerable expansion in this respect is generally admitted, and the reason for the lack of expansion is given as being the inherent caution of the New England dealer in making business connections. In the majority of cases the dealer insists on the most rigid examination of the credentials and business ability of those he appoints as his subdealers.

As a selling center for the State of Connecticut, the city of Hartford is pointed out by New Haven dealers as being the most important. It is stated that though the population of Hartford is but 107,000, as against 144,500 for New Haven, the number of cars sold in the former city in a year is considerably greater than in the latter. And the reason for the seeming delinquency of New Haven is laid down to the fact that it has but three sides, whereas Hartford has four. Furthermore, it is pointed out that Hartford is one of the richest cities, per capita, in the United States.

Central Market Report Used

As is the case in so many other cities throughout the country, the used car problem looms rather large to the New Haven dealers, though the proximity of New York has relieved matters somewhat by providing an outlet. Latterly, however, the atmosphere has been considerably clarified by the action of the New Haven Automobile Trades Association, which has subscribed for the Used Car Central Market Report of the Chicago Automobile Trade Association for its members. This has operated to stabilize used car values and the report is quite generally referred to when a used car is offered in trade or for sale.

It is the consensus of opinion, however, that the "as is" values as given in the report are slightly too high for New Haven, and for this reason the practice of subtracting about \$50 from the value given in the book is gaining. This permits the dealer who takes in the used car a margin upon which to work in order to cover overhead and such minor repairs and adjustments as may be necessary.

Electric Demand Is Good

Although the demand for electric cars is small in this particular territory, it is steadily increasing and bids fair soon to reach proportions which will not bear overlooking. There are at present approximately 75 electric passenger and commercial vehicles in the city of New Haven and the two dealers in electric cars are optimistic for the future because of the absence of hills in the city, the comparative cheapness of current, and the excellent roads in the surrounding territory. Road improvement has made it possible for the electric tourist to make such trips as to Meriden, Bridgeport or Waterbury quite easily, and this, it is pointed out, will have a stimulating effect. During the year gone by the Detroit agency distributed about 60 cars, and this, it is expected, will be increased to 75 for the present year.

The annual show, which is held in the Armory and which was brought to a close on Saturday night last, is almost exclusively a retail show, the appointment of subdealers being the exception rather than the rule. Contrary to the usual practice, members of the dealers' association, with one or two exceptions, did not exhibit at the show last week, there being a general feeling that a show at this time of the year was not exactly desirable, particularly in view of the fact that the Bridgeport and Hartford shows had just been brought to a close. Nevertheless, the show was well attended, though the crowd was slow to arrive.

Insofar as sales are concerned, it is stated that the show established a record all its own. All told, about two dozen passenger cars and two commercials changed hands. The following dealers reported sales:

Blue Ribbon Garage, two Packard and four Dodge Bros.; James McLay, six Briscoe; T. F. Feltis, eight Studebaker; Goldman & Sons, two Krebs trucks; L. W. Howshields, three Haynes; Trumbull Motor Car Co., two Trumbull; W. R. Moore, four eight-cylinder King; J. M. Henry, one Mitchell.

SYRACUSE SHOW INDICATES

GAIN OF 75% DURING 1915

(Continued from page 12)

Lake Ontario and the Adirondack mountains, there is a marked difference, and

there generally is much more snow than there is in and about Syracuse.

But even in the northern counties dealers state that there generally are not more than 60 days when cars cannot be run outside the villages, while in the centers of population a car is driven as long as there is any semblance of a broken road.

The electric business amounts to little; this type of vehicle seems to have made little progress and comparatively few of them are in use. Syracuse has several motor car factories, making cars and trucks—Franklin, Moyer, Chase, Sanford and Palmer-Moore—so that the gasoline car is naturally first in the affections of the population.

An enumeration of the cars displayed shows 90 new models, 26 used cars and 18 trucks and truck chassis, a total of 134; of these but 7 were enclosed cars. Some of the dealers planned to exhibit enclosed models but were unable to get them in time.

The Syracuse Automobile Dealers Association, which staged the show, is a corporation whose stock is owned by fifteen dealers; the membership restrictions are very rigid.

The profits are shared by the stockholders. Space is rated on an arbitrary basis, according to the desirability of location. The exhibit is managed by Harry Gardner, the business secretary of the organization. Rules are laid down and are firmly enforced and things move without a hitch.

It was the seventh annual show of the organization, four of which have been managed by Gardner; the first show ran three days; later it was lengthened to four, and this year to five.

Admission was 35 cents, and 50 cents on Society Day. Exhibitors' tickets were sold to dealers at 25 cents each and cash must be paid for them; however, any not used are rebated.

The attendance of 21,000 is about equal to that of last year's show, but it really is a better attendance than last year, for this year's show was held in snowy and cold weather, which did much to keep down the attendance.

In the Armory, which is used for the show, the cutting of a door between the infantry and cavalry halls did much to make the show pleasant; in past years it was necessary to make a circuitous trip to get from one hall to the other, but this year \$2,000 was spent in cutting the door through a brick wall.

Several factories and branches had representatives at the show, laying plans for 1915 business. C. H. McCausland, of the New York Kissel branch, rented space, displayed cars and placed an agency; Frederick E. McEwen, territorial representative, displayed the Inter-State and placed the Syracuse dealership with the Service Boat & Engine Co., E. L. Rolfson, proprietor.

The Inefficiency of the Below-par Employee

Don't Cut a Man's Salary Is Doyno's Plan—Have Only Good Men and Pay Them What They're Worth

By Ray W. Sherman

REILLY and Ben Doyno were the prime agitators in the annual outing of the Callawassa Motor Trade Association, and they always drifted together the first time the sun gave a false alarm of spring. They never did anything serious; they just talked about what they ought to do to give this annual pleasure function its proper measure of pep, ginger and good time.

It was one of the things that kept the gang in good humor, and had a reputation of being an event not to be missed. Reilly had dropped in at Ben Doyno's supply store, ostensibly to buy a couple of spark plugs, but in reality he just wanted to talk. Reilly had to talk to somebody every so often and he generally picked on Doyno.

Tried Pull to Get His Job Again

"I'll tell you what would be good this year," said Reilly, and he was just going to unfold his spontaneous idea when the telephone bell rang.

The telephone was unusually loud and it was quite apparent that the man on the other end was Bobby Hogan, King of the Ninth Ward and a political functionary of more or less impressive proportions in the town at large. Just what Bobby wanted would have been a bit puzzling to Reilly had he not been able to hear what went on at both ends of the talking instrument.

As it was, it was plain to Reilly that Bobby was anxious to have Ben reinstate in the Doyno supply store a young man who bore a distant connection to the Hogan family and who, having lost out on his job as salesman for Doyno, was exerting that old-time friend, Pull, to get the job back. Efficiency as a means of holding a job never entered the mind of the young man; the job was the big thing, and he reasoned in a political way that he was worth the salary as long as he had the job.

Taking Him Back Would Do No Good

"I'm always glad to do anything I can for you," said Doyno, for the twentieth time, "but I don't see how I can take Terry back, for he isn't of much use here. I wouldn't be doing him a good and honest turn if I took him back, for I don't think he is cut out for this kind of work and he is only wasting his time at it. He wants to find out what he is fitted for and get at it before he

has wasted half his life at jobs in which he never will get very far ahead. He——"

"That's all right! That's all right!" broke in Hogan. "If you can't you can't. You know your business better than I do. Far be it from me to urge you to do something that is not in line with good business. Terry just asked me to talk with you and see if there wasn't some prospect of getting back. But I guess you're right. He never was cut out for that business."

Terry Couldn't Be a Salesman

"No hard feelings," ventured Doyno. "Far from it! Far from it!" asserted the ward leader. "So long, Benny."

"Good-bye, Bobby."

That ended the interview, which had been a hard fifteen minutes' work for Doyno. Staving off the request of a political leader isn't always the most agreeable task in the world.

"S'matter with old Bobby?" asked Reilly. "Trying to keep the family in jobs, as usual?"

"As usual is right," echoed Ben.

"I didn't know young Terry was related to him."

"I don't think it's very close," replied Doyno, "but it doesn't have to be close to be a relationship in political circles."

"What's young Terry doing?"

"Looking for a job, I guess," laughed Ben.

"Why didn't you keep him? What ailed him?"

"He was no salesman—never would be," replied the supplyman. "He wasn't cut out for this work, and everything myself and the rest of the boys did for him didn't seem to help him much. One thing that was in his system was this political idea of job holding. He thought he was entitled to the job because of his uncle's political influence."

Doyno Simply Won't Cut Salaries

"How long did you have him?"

"Eight months—and then I told him he wasn't of much use to us and never would be and had better look for a new job. But he didn't look at all, I don't believe, for when the month I gave him was up he still seemed to expect I would keep him."

"Huh!" was Reilly's verbose comment.

"Then he—and his Uncle Bobby, too—proposed that I keep him on at a reduced salary. Flatly refused to do it!"

exclaimed Ben. "That's a thing I won't do—cut a man's salary because he isn't worth it."

"No?" questioned Reilly, not necessarily because he disagreed, but because he thought there ought to be some comment.

"That to my mind is not good business. Do you think so?"

"I don't know," lied Reilly, who did know.

"No, sir! I don't believe in it," declared Doyno. "I'll keep a man and pay him a good salary or I won't keep him at all. If he can't earn a good salary I don't want him. He's a liability."

"How so?"

Men Must Be Worth Good Pay

"I figure like this, Reilly: In my store I have goods to sell, and the efficiency of my sales force is one of the things which determine the success of my business. I need men of a certain caliber to put my stuff across to the public; in fact, I need men of a certain caliber in every department of my business. A low-grade man is no good to me.

"I figure that the men I need are worth so much a week to me, and I pay pretty fair salaries for this town. And every man who can come in here and do the work I want done is worth the salary I have put on his job, and if he can't earn the salary I don't want him. That was the trouble with Terry; he wasn't up to the standard and didn't seem to make any progress toward it, so what could I do?"

"It's just like a football team, Reilly. The best is none too good. A football team requires the best man that can be found for every spot on the team, and unless there is politics in the organization no man is going to hold his job if there is a better player in sight. And every man knows it and he works hard to hold his place.

All His Men Go to Better Jobs

"Of course, I don't mean that the men I have are the best men that can be found; they're not. But they are of a pretty high standard for a town of this size, and I think one of the best indications of their caliber is the fact that my men are always jumping to better jobs and making good at them. That is one of the best marks I know for an or-

ganization in a limited territory. If your men can go out into bigger fields and get away with it it speaks well for the place from which they jumped.

"Just like a bush league baseball team. The club which sends the most players into the big leagues is generally making a pretty good record in its own league. And the same applies to a lot of things; when you go out into the trade and find some of the best men in the business saying, 'Doyno? Sure! That's where I started in the business,' it makes you think rather well of the place, doesn't it?"

"Or else makes you think Doyno's is a good place to get out of," smiled Reilly.

"That might be true," defended Ben, "but if you ask them they'll soon put you right on that score. Gee! Wouldn't I hate to be one of those places of which the graduates say, 'Work there? Yes—but no more! Thank heaven!'"

"But couldn't you have got Terry started on the right track if you had tried?" asked Reilly.

"Tried?" exclaimed Doyno. "Tried? We tried like Trojans for the whole eight months he was here. Say, Reilly, I used to get that lad into the office and read him the best little lectures on how to advance himself that you ever heard. I used to tell him in detail some of the things he ought to do. I used to tell him to keep his face shaved and his shoes shined, but do you suppose he would do it?"

For answer to his own question Doyno

laughed contemptuously at his remembrance of the youth who had but recently left him.

"I'm as strong as anyone—not excepting Henry Ford—for giving a young fellow every chance," asserted Ben, "but it certainly was wasted effort on that lad. I suppose if I had had a factory as big as Ford's I could have got him a job as sweeper or something like that, where 150 per cent of brains wasn't required, and might have been able to use him, but I didn't, so I couldn't use him.

"Bett, out there," Doyno nodded toward one of his salesmen, "was on the wrong track when he came to me. There were a lot of things he needed to know about making himself valuable, but the difference between him and Terry was that Bett was willing to learn. If I suggested something in the way of personal progress he was quick to see it and take advantage of it. He wasn't so quick at figuring things out for himself, but he was very quick and eager to do the right thing with a little help.

"As with all the other boys. I started him in at my beginner's salary, which is a trifle more than the man is worth when he starts, but I don't like to start a man at too small a salary, for it costs money to live these days; and I was able to advance Bett right along until today he is one of the best men in the place."

"And now that you've trained him I suppose he'll be leaving you before long," said Reilly.

"I suppose so," lamented Doyno, "but

I really can't hold that up against him. After he becomes so good, the field in this town is small, and if he wants to better himself he must jump to something bigger. You can't blame a man for having ambition, can you?"

"I suppose not," admitted Reilly, twisting the paper-weight around and around.

"I have often said," Reilly added, "that on a commission basis no man could earn too much in my salesroom. If he can make five thousand dollars a year, so much the better for me. I don't believe in insisting that a man shall earn no more than a certain sum. I——"

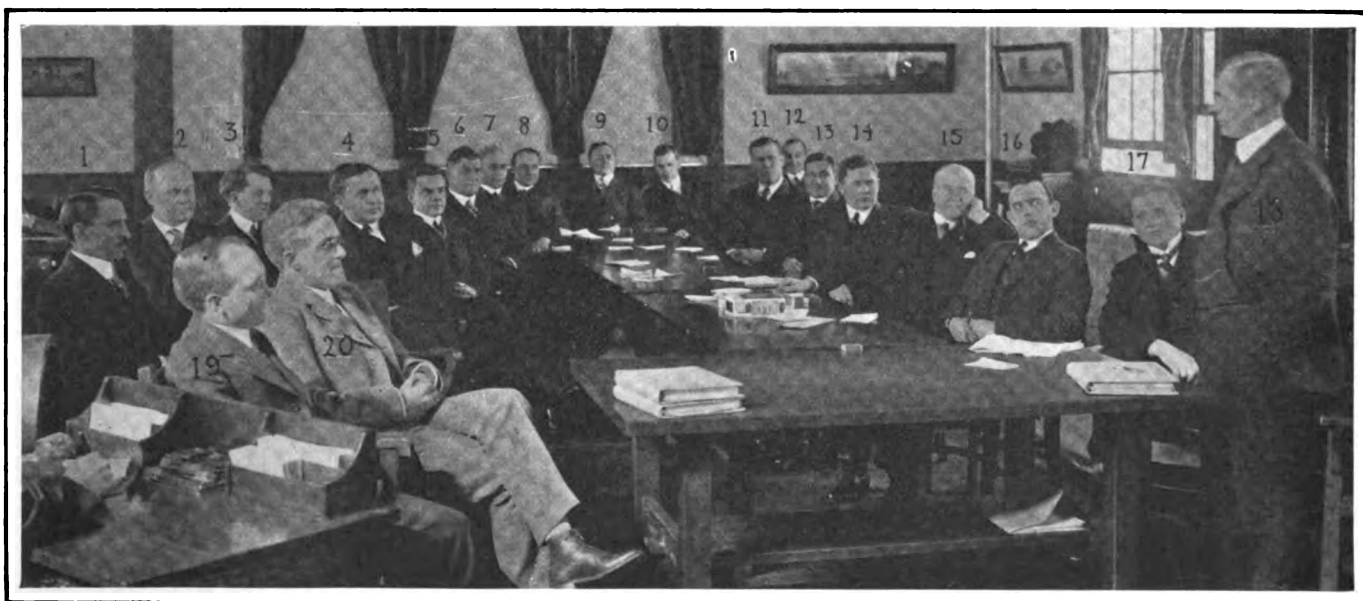
"That's all right! That's all right, Reilly! But in this business there isn't the chance for commissions that there is in selling cars. A man can make about so much in this business and beyond that he can't go far in a town of this size. There is a limit to his earning ability. If he wants to make more he must go elsewhere.

"And my plan is," continued Ben, "to figure out about what a good man ought to earn and make that the salary of my men. And I want men who can earn that amount. If I say a man should be worth twenty dollars a week I am hurting my own business by keeping a man who is worth any less. If I pay eighteen I save two dollars a week, but I lose many times that amount in the good the man fails to do my business. I want good men and I'm willing to pay them."

"Keep 'em or can 'em," said Reilly.

"That's it, exactly," was the supply-man's answer.

Chalmers District Managers Convention at Factory Feb. 8-13



- 1—H. H. Pinney, Manager of Works
- 2—Geo. Stowe, General Manager, Chalmers Motor Co. of N. Y.
- 3—L. E. Blocker, Sales Department
- 4—C. H. Booth, Manager, Detroit District
- 5—Mark Bunnell, Manager, Western District
- 6—L. L. Brocket, Traveler, Minneapolis Dist.
- 7—E. W. Nicholson, Manager, Minneapolis Dist.

- 8—A. B. Hanson, Manager, Service Dept.
- 9—G. V. Black, Traveler, Chicago District
- 10—Malcolm McCormick, Foreign Sales Dept.
- 11—John A. Wilson, Traveler, Eastern New York District
- 12—A. H. Dittmer, General Manager's Office
- 13—R. B. Bowman, Traveler, Chicago District
- 14—F. B. Willis, Manager, Eastern District

- 15—John A. Nelson, Manager, Kansas City District
- 16—Chas. E. Thompson, Traveler, Eastern Dist.
- 17—C. C. Hinkley, Chief Engineer
- 18—Hugh Chalmers
- 19—C. A. Pfeffer, Assistant Manager
- 20—Geo. W. Dunham, Consulting Engineer

Dealer's Legal Status

In Suing to Recover for Repairs and Supplies From the Owner of a Car There Are Certain Things in New York State Exempted by the Law—What They Are

By George F. Kaiser

Editor, MOTOR WORLD:

We have two customers that owe us for automobiles and other work on car repairs. One is married, owns an old car, lives in a rented house and is traveling agent for a furniture company; the other is a young man over 21 years of age, who works by the month, is not

Have you tried the collection letters which appeared in Motor World, issue of December 9, 1914? If not, write this series of letters to your debtors. The chances are you will receive a reply if you will follow out the suggestions contained in that article. If you do not receive a reply to any of these letters, the only thing further you can do is to put the matter into the hands of some responsible attorney and have him start suit. If there is no defense to your claim, judgment will soon be rendered in your favor and execution can be issued against their property, which you can then have sold to satisfy the judgment.

In New York State certain property is exempt from execution, when owned by a householder. The section of our law giving these exemptions in detail is as follows:

The following personal property, when owned by a householder, is exempt from levy and sale by virtue of an execution; and each movable article thereof continues to be so exempt, while the family, or any of them, are removing from one residence to another:

1. All spinning wheels, weaving looms, and stoves, put up, or kept for use, in a dwelling house; and one sewing-machine, with its appurtenances.

2. The family Bible, family pictures, and school-books, used by or in the family; and other books, not exceeding in value fifty dollars, kept and used as part of the family library.

3. A seat or pew, occupied by the judgment-debtor, or the family, in a place of public worship.

4. Ten sheep, with their fleeces, and the yarn or cloth manufactured there-

married and owns a Ford car. We have several times notified them, sending bill and demanding payment, but have never received an answer. The young man works for a farmer in another town and county. What can we do and how are we to go about to get our money?

Lomire, N. Y.

A. K. & S.

from; one cow, two swine; the necessary food for those animals; all necessary meat, fish, flour, groceries and vegetables actually provided for family use; and the necessary fuel, oil and candles, for the use of the family for sixty days.

5. All wearing apparel, beds, bedsteads, and bedding, necessary for the judgment-debtor and the family; all necessary cooking utensils; one table; six chairs; six knives; six forks; six spoons; six plates; six tea cups; six saucers; one sugar dish; one milk pot; one tea pot; one crane and its appendages; one pair of andirons; one coal scuttle; one shovel; one pair of tongs; one lamp, and one candlestick.

6. The tools and implements of a mechanic, necessary to the carrying on of his trade, not exceeding in value twenty-five dollars.

Probably Can Levy on Motor Car

In addition to the foregoing exemption, necessary household furniture, working tools and team, professional instruments, furniture and library, not exceeding in value \$250, together with necessary food for the team for 90 days, are exempt from levy and sale by virtue of an execution, when owned by a person being a householder, or having a family for which he provides.

In some states, as in Texas, where a carriage or a buggy are held to be exempt from execution to a family, the courts have held that a family automobile is exempt. It is not likely that the New York exemption of a team would be considered to include an automobile, however, so there should not be really any difficulty in recovering.

the balance of \$690 was to be paid "when delivery of car is tendered."

About a month later \$490 more was paid on the car, leaving a balance of \$200 due, and a few weeks later the motor car company brought suit against the brother who signed the contract for the balance.

The brother denied that he had purchased the car, saying that it had been sold to his brother and that he had signed the contract by mistake. He further pleaded the fact that he was under age as a defense. At the same time the other brother sued the motor car company to recover \$500 which he alleged he had paid on the purchase price on the ground that the company had refused to deliver the car to him.

While the car was in the possession of the motor company at its garage, a demonstrator took the brother who had signed the contract out for a ride and the car was badly damaged in a collision with a telegraph pole. Several days later, when the other brother went to the company to pay the \$200 balance due and to take possession of the car, he was told that he would have to take the car in its damaged condition or pay something over \$100 to repair it.

Court Decides What Delivery Means

The motor car company contended that, at the time the car was damaged it was the property of the brothers, while the brothers contended it had not been delivered, as the balance had not been paid.

The court held that, in law, there is a delivery of property by a seller to a purchaser when the seller places the property at the disposal of the purchaser and relinquishes to the purchaser the control and right of control of or dominion over the property and the purchaser takes or accepts the control and right of control or dominion over the property. Judgment was rendered against the motor car company on the ground that the car had not been delivered.

The Court of Appeals of Kentucky affirmed the judgment in favor of the brothers on the ground that, although there had been a sale of the property, it had never been actually used by the brothers or been in their possession.

(Kentucky Motor Car Co. vs. Durenkamp, et al, 172 S. W. 524.)

What "Fully Equipped" Means

In a recent interesting Canadian case dealing with the question of what "fully equipped" meant in its relation to a motor car, the court held that parole evidence could be admitted to show that the term "fully equipped" as used in a written contract for the sale of an automobile, means, according to the usage of trade, plain tires and not tires of some more expensive character; a car with plain tires was, therefore, held to be "fully equipped." (Halifax Automobile Co. vs. Redden, 48 N. S. 20.)

Delivery Is Tendering Car to Buyer

Kentucky Court Rules in Mixed Case Involving Two Brothers

In an interesting Kentucky case lately decided, the meaning of the word "delivery" in a contract for the sale of an automobile was explained by the court.

A motor car company sold a motor car to two brothers for \$700—\$10 was paid in cash and the contract was signed by one of the brothers and provided that

Has Two Plans for Trading in Used Cars

Makes Guaranteed Offer or Puts Customer's Car on Sale

Studebaker Dealer Considers Service of First Importance

The difficulties of trading may be solved by rigid adherence to a definite policy in regard to this feature of the business, according to Orrin S. Wilson, Philadelphia dealer in the Studebaker, whose opinion is backed by other dealers in that city.

Wilson states that the used car business in Philadelphia is virtually monopolized by one concern and the prices which they offer have been found to be a fair basis from which to determine the value of used cars. This is in effect a clearing house.

When a prospect comes to him and offers a trade, Wilson obtains from the used car dealer an offer for the old car. He then guarantees to the customer the amount of that offer. He will then sell the used car to the dealer at the price offered, or, if the owner feels that there is a possibility of obtaining more for it Wilson will place it on sale for a reasonable length of time.

Selling Plan Is Fair to Everyone

If he succeeds in obtaining more than the guarantee he makes an additional allowance to the customer after the used car is sold. If he should be unsuccessful after a reasonable length of time the used car is sold to the dealer.

There are instances where the owner prefers to hold the old car for a better price than is offered by the used car dealer. In those cases Wilson does not care to tie up his money indefinitely so the owner is required to purchase the new car at the full price and Wilson takes the used car on sale for the owner.

This plan is considered fair and equitable for both the dealer and his customer. Wilson sells his cars at list and does not resort to subterfuges to dispose of them or to cut his legitimate profits.

He has a sales force of six men, and each of them has a day on duty in the salesroom each week. To the man on duty he gives all of the prospects who call at the salesrooms. The mail prospects, however, he distributes among the men.

The system of recording prospects

Name				Date	
Address—Office			Address—Home		
Telephone			Telephone		
Owns	Model	A	N	Business	Demonstration
Owned	"	B	O	Position With Firm	Time
Prefers	"	C	P	Source of Prospect	Place
Friends Own	"	D	Q	Remarks	Date
Pres.—Future Immediate	Monthly	E	R		
	Semi-Monthly	F	S		
	Weekly	G	T		
Called at Office	Semi-Weekly	H	U		
	Tri-Weekly	I	V		
	Daily	J	W		
Garage		K	X		
Chauffeur		L	Y		
		M	Z		
					Salesman

The record card used for keeping track of prospects goes into details with unusual thoroughness to provide the salesman with every possible bit of data

goes into much detail not ordinarily considered necessary by dealers, but Wilson holds that he needs every possible bit of information about the prospect and what the salesmen are doing to effect sales. The office record is made on an index card 4 x 6 inches, and when it is prepared two copies are made on a bond paper, showing the same data. The card is filed in alphabetical order, and one of the copies is filed alphabetically but separated according to the salesman who may have the name. The other copy is given to the salesman for his personal record.

The same form is used for the daily reports made by the salesmen. They are made in duplicate, one of which is filed by the salesmen and the other by the office. The office report is placed in the salesmen's files following the name of the prospect.

Close Check Kept on Salesmen

The daily reports are dated to show the day on which a call was made and a check is placed in the proper space to indicate when the next call is to be made. The clerk handling the office file removes each day the reports of salesmen indicating that calls are to be made on the day following. The salesmen are then notified of the calls scheduled; 48 hours after calls were to have been made if no reports are received, the salesmen are called on for reports, and if after an additional 24 hours the office is still without reports the matter is taken up by Wilson, who asks for explanations. If it is found that the salesmen are neglecting good prospects, the names are transferred to other salesmen. In any cases where salesmen make no report

within 30 days the names are transferred.

The service station which Wilson conducts in connection with his salesroom is at present three blocks away. He believes, however, that service is the most important feature of his business, and for that reason contemplates the erection of a building adjoining his salesroom or the lease of a location next door.

Personal Attention to Repair Bills

In the matter of his service Wilson considers that he must give his personal attention to all repair bills. While he aims to prevent any unfair advantage being taken of his free service, he nevertheless sees to it that his customers are not charged for service to which they are entitled. He also believes that his customers should be given every opportunity to talk with him personally about their cars and the service, whether it is for the purpose of making complaints or not. Being the boss is a responsibility which he does not turn over to others simply because it involves listening to complaints.

In the formation of his sales force Wilson has ideas which are opposed to those of many dealers, due, perhaps largely, to his wide experience. It is his contention that selling methods are substantially the same in all sections and that success depends upon service, provided that, to start with, the product sold is right. Accordingly, he holds that a salesman who made good in Colorado can do equally well in New England or elsewhere. One of his men was with him at the time he was branch manager in the West and also in New England. In his work in Philadelphia that man

is meeting with equal success, seeming to prove the soundness of the doctrine that is expounded by Wilson.

In promoting the success of his sales force Wilson claims that the personality of the proprietor has a potent effect upon a large percentage of the prospects. For that reason he not only makes it part of his duties to talk with prospects who call at the salesrooms, but also makes personal calls on them, so as to lend his influence to closing sales. He gives this assistance without prejudicing in any way the right of the salesmen to their commissions on sales made through his efforts.

The personal assistance which he gives is supplemented further by letters and advertising matter sent the prospects from the factory. That the factory may give its cooperation, Wilson sends there the names of all prospects that come into his hands just as soon as they are placed in his files.

Not Jealous of Names

Asked whether he did not consider that a list of names of prospects is one of the valuable assets of his business, Wilson said that in his opinion no harm would be done him if his entire list were in the hands of each of his direct competitors.

The explanation he gave was that prospects having open minds as to the special make of car they would buy would inevitably shop around among the dealers in all cars offered at the price they were able to pay. That being the case, the names of all such prospects would, as a matter of course, be in the possession of all those dealers.

Therefore, it is contended, it would not place his competitors at a disadvantage to guard his prospects with any great degree of care. On the other hand, those persons who had already decided on a particular car would be safe from competitors.

Expansion and Need for Oil Govern Piston Clearance

Ideal Fitting Practice Modified by Manufacturing Considerations—Piston Rings and Pins Require High Degree of Accuracy

Fitting new pistons to old cylinders is a job the repairman is frequently called upon to perform, and the importance of doing the work properly is usually appreciated. For this reason, and also for the reason that definite information on the subject of relative sizes of pistons and cylinder bores is not always easy to obtain, the paper on "Allowances for Piston Fits" read by E. W. Weaver at the annual meeting of the Society of Automobile Engineers is of more than passing interest. Only water-cooled motors are dealt with. The paper follows:

Piston Pin Fit an Important Point

The question of the fit of the piston in the cylinder is not that of a solid plunger operating in a cylinder of heavy enough body and surrounded by such conditions as to insure an unchanging form, and permitting of copious lubrication. The problem is that of a comparatively delicate piston working in a cylinder the walls of which are as thin as the designer dares make them and which is subject to great variations of temperature at different points. Lubrication, too, must be held down to the minimum in order to conform to various smoke ordinances, or lacking such inducements, to one's own sense of the fitness of things.

The question of the ideal allowance to make will be considered apart from that of manufacturing tolerances. Some engineers use the very convenient rule of making the piston .001 small for each inch of the diameter of the cylinder bore.

I believe that the following rule comes

closer to actual requirements: Allow from .002 to .0025 for each inch of diameter above 2 inches.

As it is impossible to manufacture commercially parts that are all exactly alike, due allowance must be made for variations. The engine builder has the choice of the following three methods: (1) putting limits on the drawings and holding the inspection to such a point that any piston will work in any cylinder; (2) sorting the cylinders and pistons according to size, and assembling the large pistons in the large cylinders, etc.; (3) making all the pistons a closer fit than they are expected to run and lapping them down to the proper fit, each in its own cylinder.

Good Rule for Practical Use

I shall touch on the first method only, that of strictly interchangeable production. The fixing of the limits to which the shop is to work is very important, as it affects directly the cost of the product. My idea is that the drawing should represent what the engineer expects, what the shop will guarantee, and what the company is willing to pay for.

Considering the cylinder first, a permitted variation between maximum and minimum size of .0015 is absolutely necessary—.002 is the ordinary allowance—and the cylinder must not be tapered or be "out of round" to in any wise exceed the given allowance.

A variation of .001 between the maximum and minimum for the piston is the usual allowance.

If wider limits are given, more care must be exercised in assembling, or the quality of the engine will be lowered.

The head of the piston, being exposed to the intense heat of the explosion, must be made considerably smaller than the skirt. The amount is usually fixed at from .002 to .0025 small for each inch in diameter.

The fit of the piston ring in the groove is another particular point. The ring must be loose enough to operate freely and close enough to prevent gas from leaking past. The minimum allowance that is safe is .0005, and the tolerances on both ring and groove must be given in such a way that this allowance is not diminished. The closest limits that are being worked to commercially are .0005 variation between the minimum and maximum of both ring and groove width. This would be expressed on the drawing as

.2500
ing as .2495 for the width of the groove
and .2490
.2485 for the ring.

Allowance must be made between the ends of the piston ring for expansion under heat. From .006 to .015 is the usual amount allowed.

Should Follow Drawings Exactly

The fit of the piston-pin in the piston is the final point at which great care must be exercised, the proper allowance allowed for the fit being .001 of an inch. The hole in the piston being reamed or broached can be held from exact size to .0005 under size. In the case of a one-inch piston pin, the hole in the piston would be dimensioned from 1.000 to .9995, while the piston pin would be given as .9990 to .9985, thus insuring a minimum allowance of .0005 and a maximum allowance of .0015.

WIDE-AWAKE MERCHANDISING

LADIES' RECEPTION SOLD 3 CARS

**Personal Invitations Brought Ladies to Salesroom Where
They Were Encouraged to Enter Cars and
Manipulate Levers—Cost Was Small**

Believing that more comment and progress result by introducing motor cars to women than to men, the Cheboygan Auto Sales Co. recently gave a reception to the women of Cheboygan, Mich., in its salesrooms. Invitations were in the form of personal letters to the women, inviting them to attend and bring their friends. This brought in quite a few men.

To each visiting woman was given

a little cluster of sweet peas. The decorations consisted of carnations. Candies and nuts were placed on tables in the salesroom. Since it was believed that music would divert attention from the cars there was no orchestra.

"Wherever possible," states Manager J. C. Rittenhouse, "we had the ladies get in the cars and manipulate such parts as the starters, throttles and so forth, while the cars were running idle,

which we found created quite a good deal of enthusiasm. They would grasp the mechanical part and go away with the feeling of confidence that they could immediately handle the machine if they purchased it.

"Our keeping it exclusively to the ladies as much as possible worked out to fine advantage. We had a large crowd and during the afternoon sold three cars and booked a good many live prospects.

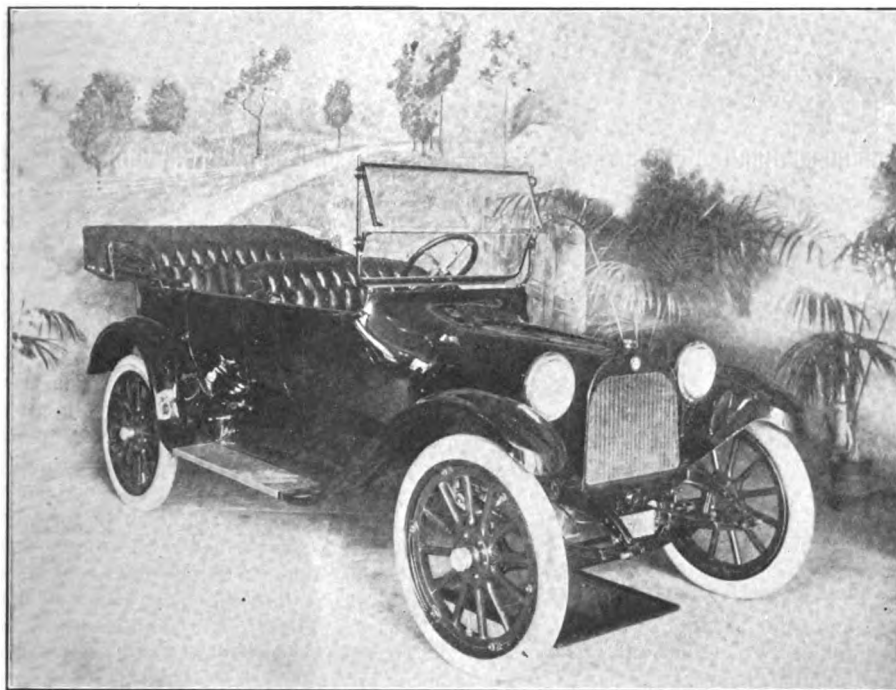
As to the expense involved, it was very nominal, the principal items being the dainty bouquets which were given away and the letters which were sent out. We feel well repaid and I think no sales company would make a mistake in pulling this stunt off at least once a year."

Cleanliness and Neatness are Prominent Features of this Accessory House



This shows the interior arrangement of the salesroom of the Bering Tire & Rubber Co., Houston, Tex., and brings out forcibly the thought that has been put into the placing of the various display fixtures, the showcases, etc. Cleanliness and order are the dominating features. The company is

distributor for Texas for Acme Red Letter tires, operates a vulcanizing plant, has both Bosch and Schebler service stations and is the official A. A. A. headquarters for the state. Aug. C. Bering, Jr., attributes his success to the fact that list price is maintained or the sale is abandoned



The only properties necessary for this display window by the Galveston Motor Car Co., Galveston, Tex., Dodge dealer, were the painted canvas drop at the back and some potted ferns. The latter were rented for a small sum. The drop was painted on an old car covering which had lain around the garage for some time and was considered worthless. The painting cost \$5

MAKE YOUR TIME AT FACTORY VALUABLE

Put Down in a Book What You Came For and Then Make Use of the Book

Many dealers are visiting the factories all over the country. Especially is this true of those attending sales conventions and those whose localities are so blocked in by snow that there is very little activity. These men frequently come to the factory at big expense and then spend only an hour or two there—and that in the office of the sales manager.

The wise dealer takes a book and makes a note of the matters he wants to take up with the factory and then he **USES THE BOOK** when he gets there. It is so easy to forget and matters are so much more pleasantly and satisfactorily adjusted in person that the wise dealer keeps his memorandum book in sight till every item is crossed out.

What are the things you want to know? Put them down. If you do not you will be sure to forget. And you may lose a sale just because you forgot that one point. If you want to get more thoroughly posted on repair work get the cooperation of the service man at the factory. In the rush and hum of the day's work it is easy for someone to put you off—but remember that your bread and butter is at stake—your reputation will suffer unless you are fully prepared to give good service—"and buyers are looking for it," as one dealer remarked a few days ago. "We must be prepared

to give it to them if we want to stay in business."

There is no advantage in having a large prospect list. What you want is a live prospect list. Prune your list. Go over it with thorough care and pick out the live ones. Then get busy!

WORK MAILING LIST HARD

Now Is the Time to Bring Your List Right Up to Date—Mail Literature

This is the time of year when your mailing list should be brought right up to the minute if it is not regularly kept in that condition. People are certainly going to buy cars this year, and they are trooping in and out of salesrooms all over the country now. They may come to see you—some of them. But why not get a start over the other fellows by getting your mailing list in slick shape and then using the mails to carry to your prospects the good literature that you get from the factory?

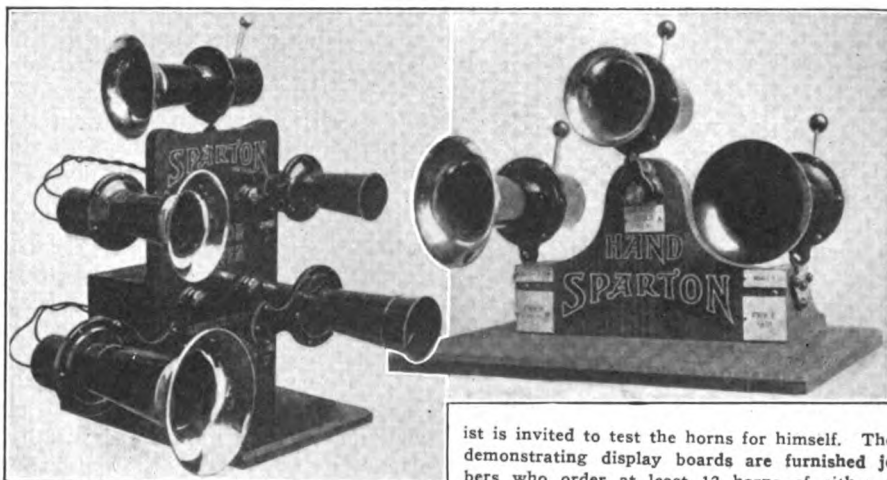
There is hardly a manufacturer—indeed, it is safe to say that there is not one—but will be willing to supply you free of charge with everything in the way of advertising literature that you need to mail out. Now is the time to get busy.

WORK THAT MAILING LIST HARD. Then have your men follow up prospects early. Get all the information you possibly can and when they are ready to buy you will already have them half closed.

This is important. All too many dealers wait till the last minute. Now is the time to make your plans and now is the time to start carrying them out systematically.

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. Two are illustrated herewith and these will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



These two display stands, which are supplied free, with the necessary batteries, by the Sparks-Withington Co., Jackson, Mich., have proven stimulants to the sale of Sparton horns. Both may be mounted on a showcase where the motor-

ist is invited to test the horns for himself. These demonstrating display boards are furnished jobbers who order at least 12 horns of either the motor-driven or hand-operated type. They are well-finished fixtures of substantial construction and in addition to displaying the horns they carry, they also have small tickets which give the model of the horn and its price. They are, in effect, "silent salesmen."

Advanced Maintenance

BRAZING AND WELDING

By George Fernwell

(Continued from last week.)

With the metal parts heated uniformly through to a temperature at which the spelter would melt and flow independently of the blow-pipe flame, the liquid melted spelter would penetrate completely through between the two surfaces. If the spelter were applied at the top of the joint between two perpendicular metal faces, the latter should be heated so that the spelter upon melting would flow between and all the way through and out of the bottom of the joint.

When the joint has cooled and has

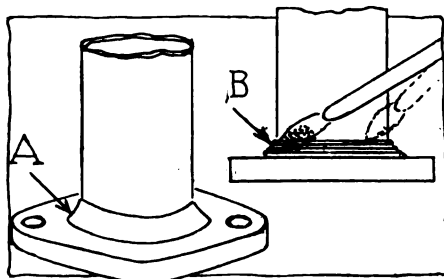


Fig. 1—A fillet of spelter, A, means a fine job but a difficult one. An easier method is to run spelter over a foundation of copper wire, B

been filed all around a fine yellow line of brass should show through the filed surface. Should the work be unusually difficult or should it be impractical to braze completely through at one heat with the joint in any one position, it may be advisable, after brazing in one position, to turn it over in the forge or upon the brazing hearth, so that the under side will be brought uppermost. Then finish brazing with the work in the new position.

Least Risk With Soft Spelters

The degree of heat required to properly braze various metals when using spelter of suitable hardness means that the metals being joined would be subjected to a heat which, in the case of inexperienced hands, would be dangerously near the burning point, although to an expert the risk might be considered slight.

It may perhaps now be seen why "easy flowing" but "weaker" spelters are offered for general use to offset lack of experience and minimize the risk of burning the work at the expense of strength.

A workman well satisfied with his

success with the ordinary spelter referred to, never having had experience with the harder spelters, would probably experience failure when first attempting to use the harder spelter and should therefore proceed cautiously in the latter event.

Flame Must Be Properly Directed

In addition to the need for closely watching the process of the work at the point of brazing, care must be taken that prolonged application of the blow-pipe flame at one portion of the work does not result in burning or commencing to melt metal surfaces adjacent to the joint.

The risk of burning may be greatly lessened, especially in the case of copper, brass or light steel tubing, by directing the blow-pipe flame at a tangent with the pipe. The flame will not so quickly burn the metal if allowed to glance sideways from the joint instead of being aimed directly at it.

In the case of a similar risk of burning in such work as brazing a comparatively heavy steel or iron member to a very much lighter one of steel, copper or brass, such as brazing a steel flange to a copper pipe, the blow-pipe, if one is used, should not be directed at the lighter metal but only at or underneath the heavier metal.

A refinement of skill in brazing flanges on steel or copper tubing is the forming of a fillet of brass from the spelter in the angle of the flange and the pipe, Fig. 1. This fillet greatly strengthens the joint and in addition makes it look like a real job; it requires unusual skill, however, to form it from spelter alone, and an easier method is here given.

Making Fillets in Angles of Joints

Before commencing to braze the flange to the pipe, wind fine copper wire not more than .010 of an inch in thickness in regular and close coils around the tubing close to the flange. This will form a foundation for the fillet. The flange may then be brazed to the pipe, applying the heat to and underneath the flange only, as already has been directed, but applying the spelter to the tubing above the top of the copper wire all around the pipe, so that gravity will cause the melted spelter to flow down-

ward between the coils and penetrate the joint. Then by a nice adjustment of the blow-pipe flame the heat which previously had caused the spelter to flow freely should be slightly lessened so as to melt the spelter sufficiently for it to flow on the surface of the copper wire fillet and remain there instead of flowing past and into the joint which already has been filled. The condition of the fillet would be that of a copper foundation or inner fillet coated with spelter, so that if carefully filed up it would have the appearance of a solid brass fillet. Of course, if the brass were filed too deep the copper wire would show and impair the appearance a little.

Superfluous Spelter Makes Extra Work

The position of the joint in brazing and the manner in which spelter is applied are important. Superfluous spelter should not be allowed to run all over the metal adjacent to the joint, and form, when cold, lumps of brass which usually adhere near the joint where full length strokes of a file could not be used. Wherever they occur, however, it is a tedious and time consuming job to remove them, and the cost of doing the work is correspondingly increased.

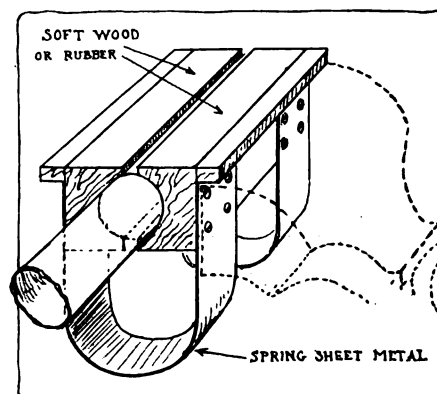


Fig. 2—To prevent damage to pipes they are best held for filing in a vise clamp with grips of soft wood or rubber mounted on spring metal

It is most inadvisable to attempt to chip superfluous brass away with a chisel; the almost certain results will be that the softness of the copper, especially after the annealing effect of the heat of brazing, will permit the distortion of the tube.

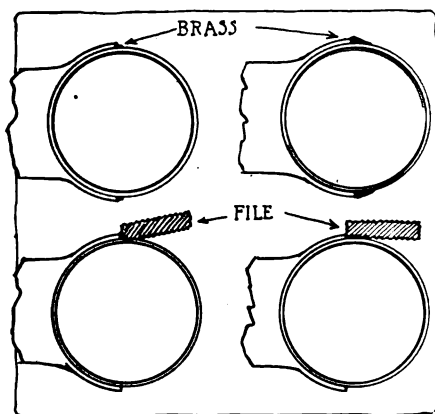


Fig. 3—The neatest way to finish a saddle joint is shown in upper left; upper right shows an alternative way. Lower left shows wrong way to hold file; lower right shows correct position

Where superfluous spelter has been applied it is sometimes possible to remove it with a wire brush immediately after brazing and while red hot, at the same time removing most of the superfluous flux. If it is not possible to remove all the superfluous brass in the above manner it may be possible and worth while, to save subsequent filing, to reheat with blow-pipe and charcoal or fire-brick, so that the remainder can be brushed off or guided to some part of

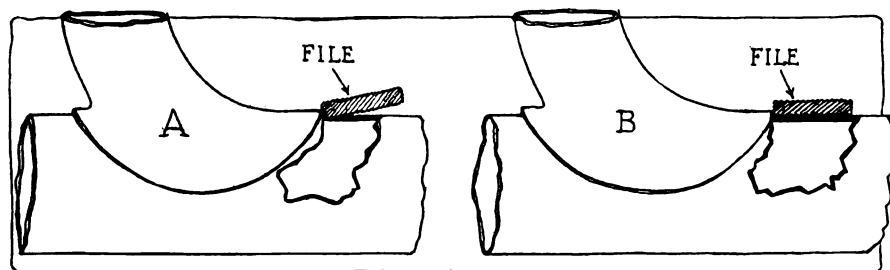


Fig. 4—In filing across the pipe to finish a saddle joint the file must be kept flat on the pipe or it will cut a groove into the copper

the joint which will permit effective use of a file.

When finishing, a manifold cannot be held firmly in an ordinary vise by the tubing without the risk of crushing or flattening it; therefore a pair of cylindrical clamps should be used which conform exactly to the diameter of the tubing.

In filing the edge of the saddle-shaped flange of a branch where brazed to the main pipe of a manifold, the best looking work is that in which the extreme edge of the saddle flange is brought out in sharp relief by skilfully filing at the edge so as to form a fillet of almost imperceptible radius in the brass.

In finishing the work by this method great care must be taken in the manner of holding the file against the work. If the edge of the file is tilted even slightly the tendency will be to file a notch or a groove partly through the main pipe close to the flange.

The probable result, in addition to unsightly appearance, would be that the

manifold would crack when subjected to vibrations when in use. Accordingly in the first stages of filing the work the edge of the file should not be tilted or raised from contact with the metal when the file is being used transversely to the main pipe, and when used lengthwise the file should be held at a true tangent with the cross-section of the main pipe.

Hard to Braze With Soft Coal

All traces of brass should be removed with the file from around the joint. If any such parts of the surface of the copper are allowed to remain coated with brass, and the manifold is polished in that condition, the brass will show up in blotches of yellow against the background of polished copper. This applies also to filing up iron or steel joints.

In brazing with a blacksmith's forge charcoal is the cleanest and best fuel if it can be had; coke is a good substitute. Soft coal produces so much thick smoke, with resulting deposits of soot, and contains so much sulphur that it is difficult to keep the work sufficiently clean for successful brazing. If hard coal is used it takes a comparatively large and well arranged fire to obtain sufficient heat.

With either kind of coal the fire should

Good judgment, some experience in the more easily performed brazing work, and some practice on worthless castings, should result in the acquisition of the necessary skill. The process is one which closely approaches that of welding, inasmuch as the parts to be joined are brought nearly to the melting point. A few workmen become so expert at this process that they can perform the operation of brazing brass without any special precautions against the risk of the brass becoming melted.

Clay Mould for Brazing Castings

A more practical method adapted to the average degree of skill is to confine the two parts to be brazed in the equivalent of a mould conforming to the contour of the casting so as to permit the latter being heated for brazing, but holding any part which might become melted, from losing its normal shape or position or from melting and running away in the brazing fire.

A material which can be effectively used for forming a mould is fire clay, sufficiently moist, after thoroughly mixing with water, to hold together, something like ordinary clay.

To be always prepared for such work at short notice, a pail should be filled with fire clay already moistened and kept ready for use. The clay will stay kept ready for use.

Thoroughly clean the surfaces to be joined and also the surface to a con-

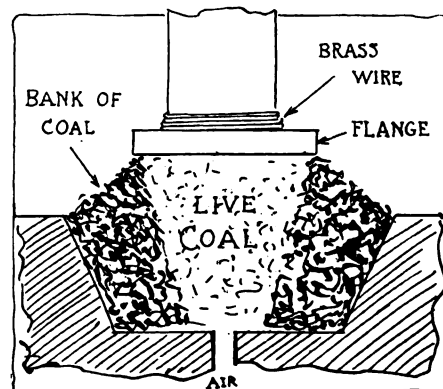


Fig. 5—For brazing in a blacksmith's forge a deep, clean fire is necessary

be made deep to minimize trouble from oxidizing of the surfaces to be brazed, and in the case of soft coal the fire should not be used for brazing until it is as free from smoke as possible.

Under these conditions it is a help to use very fine brass wire in place of or before using the spelter; it should be wound in several coils around the joint so as to cover the entrance to the joint. Upon the work being brought to the proper heat the brass wire should melt and enter the joint at all points, thus somewhat lessening the trouble which might otherwise be experienced from exposing the actual entrance of the joint to oxidation.

The experience required to successfully braze broken brass castings is of great service in the repair-shop in repairing cast-brass fittings.

By the successful brazing of such broken brass castings the expense of new ones or, what is sometimes more important, delay, often can be avoided.

siderable extent adjacent, to remove every particle of grease or tarnish, by dipping the parts in strong potash or acid, or by thoroughly cleaning with a wire brush or by filing.

Fill a sheet metal pan or box of suitable size with the moist fire clay, kneading or working the clay thoroughly to ensure there being no hard masses or lumps; place the pan of clay on the brazing hearth in a convenient position. Next, carefully embed the parts of the broken casting in the fire clay, pressing the casting down in such a manner and position that the uppermost surface of the part which must be heated is level with the upper surface of the fire clay.

RECENT DEVELOPMENTS in ACCESSORIES

Non-Gran Bronze in Bars of All Sizes

The American Bronze Co., Berwyn, Pa., has just placed on the market a new assortment of its Non-Gran bearing metal which should prove popular with the garageman, the repair-shop operator and the supply house. The assortment consists of one solid bar and five cored bars with which 54 different sizes of bushings can be made; from which the assortment takes its name—"6-54."

The six bars are packed in a strong box and include the following sizes: A, $\frac{7}{8}$ -inch solid; B, 1-inch outside diameter, $\frac{1}{2}$ -inch inside diameter; C, $1\frac{1}{4}$ -inch outside diameter, $\frac{5}{8}$ -inch inside diameter; D, $1\frac{3}{8}$ -inch outside diameter, $\frac{3}{4}$ -inch inside diameter; E, $1\frac{1}{2}$ -inch outside diameter, $\frac{7}{8}$ -inch inside diameter; F, $1\frac{5}{8}$ -inch outside diameter, 1-inch inside diameter.

The assortment weighs approximately 21 pounds and the net price to the dealer is $47\frac{1}{4}$ cents per pound, making the cost of the complete assortment about \$9.90. The material retails at 75 cents per pound.

Danver Auxiliary Ford Oiler

An auxiliary oiling system for the Ford motor, which provides for a comparatively large supply of oil and is automatic in its operation, is one of the products of the Danver Accessory Co., Pawtucket, R. I. The attachment requires no machine work and can be effected, the makers state, in one hour.

The equipment supplied consists of a special oil sump for the bottom of the crankcase and a pipe for connecting the sump to the hole at the bottom of the flywheel housing; on the side of the oil

Flowing into the flywheel housing through the connecting pipe, the oil is picked up by the flywheel, discharged into the tube leading to the timing gears and then flows over the top of the crankcase plate at a depth of $\frac{1}{4}$ inch; this depth, which is correct for proper lubrication, cannot be exceeded because any surplus will be carried off by the stand pipe. Returning to the reservoir, the oil is cooled by radiation and again flows to the flywheel housing for recirculation. Price, \$6; dealers, $33\frac{1}{3}$ per cent.

Rie-Nie Valve Grinding Compound

The Durkee-Atwood Co., Minneapolis, puts up valve grinding compound in both large and small cans, the latter of the duplex type containing coarse and fine grain for roughing and finishing valves and seats. Duplex cans, 30 cents each; packed 12 in a carton and 6 car-

tons in a case; dealers, 40 per cent. Large cans for shop service, 50 cents each; put up 50 in a case; dealers, 40 per cent.

Blue Edge Asbestos Brake Lining

The lining made by the Woven Steel Hose & Rubber Co., Trenton, N. J., is woven from long fiber asbestos yarn,

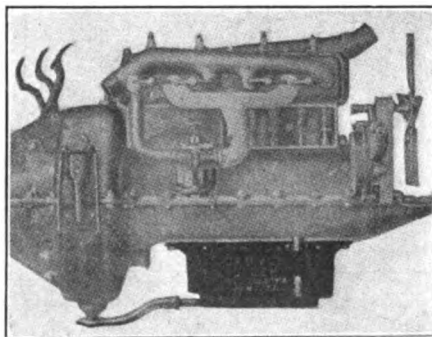


The package in which the 6-54 Non-Gran assortment is put up

stranded both ways with brass wire. It is made in the usual standard widths from 1 to 4 inches, and thicknesses of $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$ and $\frac{1}{4}$. Price, $1\frac{1}{2}$ -inch, 60, 65, 70 and 90 cents; 2-inch, 80, 85, 90 and \$1.20. A special lining for Ford cars, woven of asbestos without brass wire, is made under the name Red Edge. Blue Edge lining is put up in rolls of 25, 50 and 100 feet, and Red Edge is packed in boxes with rivets sufficient to equip a Ford car.









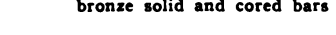
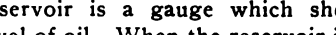
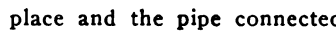
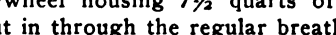
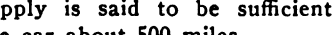




Enduro Friction Fabric for Brakes

A single type of solid woven asbestos brake lining is manufactured by the



The Danver auxiliary Ford oiler is attached under the crankcase

BUSHINGS OF 54 SIZES THAT CAN BE MADE FROM 6 NON-GRAN BARS

Diameter Inside	Diameter Outside	Bar	Diameter Inside	Diameter Outside	Bar	Diameter Inside	Diameter Outside	Bar
	"A"	$\frac{3}{8}$	$\frac{1}{2}$	A	$\frac{3}{4}$	$\frac{7}{8}$	B or C	1
	"B"	$\frac{3}{8}$	$\frac{9}{16}$	A	$\frac{3}{4}$	$\frac{15}{16}$	C	1
	"C"	$\frac{3}{8}$	$\frac{5}{8}$	A	$\frac{3}{4}$	1	C	1
	"D"	$\frac{3}{8}$	$\frac{11}{16}$	A	$\frac{3}{4}$	$1\frac{1}{16}$	C	1
	"E"	$\frac{3}{8}$	$\frac{3}{4}$	A	$\frac{3}{4}$	$1\frac{1}{8}$	C	..
	"F"	$\frac{7}{16}$	$\frac{9}{16}$	A	..	..	$1\frac{1}{16}$	$1\frac{1}{4}$
	"D"	$\frac{7}{16}$	$\frac{5}{8}$	A	$\frac{13}{16}$	$\frac{15}{16}$	C	$1\frac{1}{16}$
	"E"	$\frac{7}{16}$	$\frac{11}{16}$	A	$\frac{13}{16}$	1	C	$1\frac{1}{16}$
	"E"	$\frac{7}{16}$	$\frac{3}{4}$	A	$\frac{13}{16}$	$1\frac{1}{16}$	C	..
	"E"	..	..	..	$\frac{13}{16}$	$1\frac{1}{8}$	C	$1\frac{1}{8}$
	"E or F"	$\frac{1}{2}$	$\frac{5}{8}$	A	..	..	$1\frac{1}{8}$	$1\frac{3}{8}$
	"E or F"	$\frac{1}{2}$	$\frac{11}{16}$	A	..	..	$1\frac{1}{8}$	$1\frac{7}{16}$
	"F"	$\frac{1}{2}$	$\frac{3}{4}$	A	$\frac{7}{8}$	1	C or D	$1\frac{1}{2}$
	"F"	..	..	..	$\frac{7}{8}$	$1\frac{1}{16}$	C or D	..
	"F"	$\frac{9}{16}$	$\frac{11}{16}$	A	$\frac{7}{8}$	$1\frac{1}{8}$	C or D	..
	"E or F"	$\frac{9}{16}$	$\frac{3}{4}$	A	$\frac{7}{8}$	$1\frac{3}{16}$	D	$1\frac{3}{8}$
	"F"	..	..	..	$\frac{7}{8}$	$1\frac{1}{4}$	D	$1\frac{7}{16}$
	"F"	$\frac{5}{8}$	$\frac{3}{4}$	B or A	..	..	$1\frac{3}{16}$	$1\frac{1}{2}$
	"F"	$\frac{5}{8}$	$\frac{13}{16}$	B	..	..	..	..
	"F"	$\frac{5}{8}$	$\frac{7}{8}$	B	$\frac{15}{16}$	$1\frac{1}{16}$	C or D	$1\frac{1}{4}$
	"F"	..	..	..	$\frac{16}{16}$	$1\frac{1}{8}$	C or D	$1\frac{1}{4}$
	"F"	$\frac{11}{16}$	$\frac{13}{16}$	B	$\frac{15}{16}$	$1\frac{3}{16}$	D	..
	"F"	$\frac{11}{16}$	$\frac{7}{8}$	B	$\frac{15}{16}$	$1\frac{1}{4}$	D	$1\frac{1}{2}$

The 6-54 assortment of Non-Gran bearing bronze solid and cored bars

reservoir is a gauge which shows the level of oil. When the reservoir is bolted in place and the pipe connected to the flywheel housing $7\frac{1}{2}$ quarts of oil are put in through the regular breather; this supply is said to be sufficient to run the car about 500 miles.

Phillip Cary Co., Cincinnati; it is made of 3-ply asbestos yarn and fine brass wire. A special lining is the $1\frac{1}{8}$ x $5/32$ wireless fabric for Ford transmissions. Stock widths are from $\frac{3}{4}$ to 5 inches,

and thicknesses $\frac{1}{8}$ to $5/16$ inch. Prices, $1\frac{1}{2}$ x $\frac{1}{8}$, 60 cents per foot; $5/32$, 65 cents; $3/16$, 70 cents; $\frac{1}{4}$ -inch, 90 cents; 2-inch width, 80, 85, 90 and \$1.20. Discounts vary from 65 to 85 per cent.

VARIETY IN CLAMPS FOR RADIATOR HOSE

Made of Wire, Tape and Castings, Sheet Steel and Brass

Yerdon

The hose clamps manufactured by William Yerdon, Fort Plain, N. Y., are of cast brass and can be used many times. The clamp is held by a bolt passing through heavy lugs, and a tongue crossing the gap is integral with one end of the clamp and runs into a groove in the other. Back of each lug there is a shoulder; the jaws of the compression tool used for closing the clamp on the hose are applied at the shoulders. All sizes are made.

The sizes used most for motor car work are for 3-ply hose from 1 inch to $2\frac{1}{2}$ inch; prices, 1-inch, \$2 per dozen; $1\frac{1}{4}$, \$2.50; $1\frac{1}{2}$, \$3; $1\frac{3}{4}$, \$3.50; 2-inch, \$4; $2\frac{1}{4}$, \$5.50, and $2\frac{1}{2}$, \$7. Dealers, under gross lots, 70 and 5 per cent; up to 10 gross lots, 75 per cent; over 10 gross lots, 75 and 5 per cent. Tools for adjusting clamps 1-inch and $1\frac{1}{4}$, 8 cents; $1\frac{1}{2}$ and 2 inch, 14 cents; 2 to $2\frac{1}{2}$ inch, 20 cents each.

Catelain

The Catelain hose clamp, sold by the

Powers Sales Co., Chicago, is so constructed that three sizes will fit all hose sizes from $\frac{3}{4}$ inch to 4 inch; it can be applied without tools.

The band is of sheet brass $\frac{3}{4}$ inch wide with several slots cut in the middle; the clamping screw ends in a T-piece held in a loop of the band and has a wing-nut for tightening by hand. The clamp is adjusted to the hose it is to be used on by measuring the circumference and folding the brass to the proper length over a slotted stud B, the screw lying in the slot and having a small bushing A to take the pull of the nut. A brass flap C crosses the gap.

No. 1, $\frac{3}{4}$ to $1\frac{1}{2}$ inch, 20 cents each; dealers, 13 cents; \$1.35 per dozen; No. 2, $1\frac{1}{4}$ to $2\frac{1}{2}$, 22 cents; dealers, 14 cents; \$1.50 per dozen; No. 3, $2\frac{3}{4}$ to 4 inch, 25 cents; dealers, 16 cents; \$1.75 per dozen.

Metal Stamping Co.

Three types of hose clamps are manufactured by the Metal Stamping Co., Long Island City, N. Y., two of which are tightened with a bolt in the con-

ventional way while the other is applied with a special tool and will fit any hose.

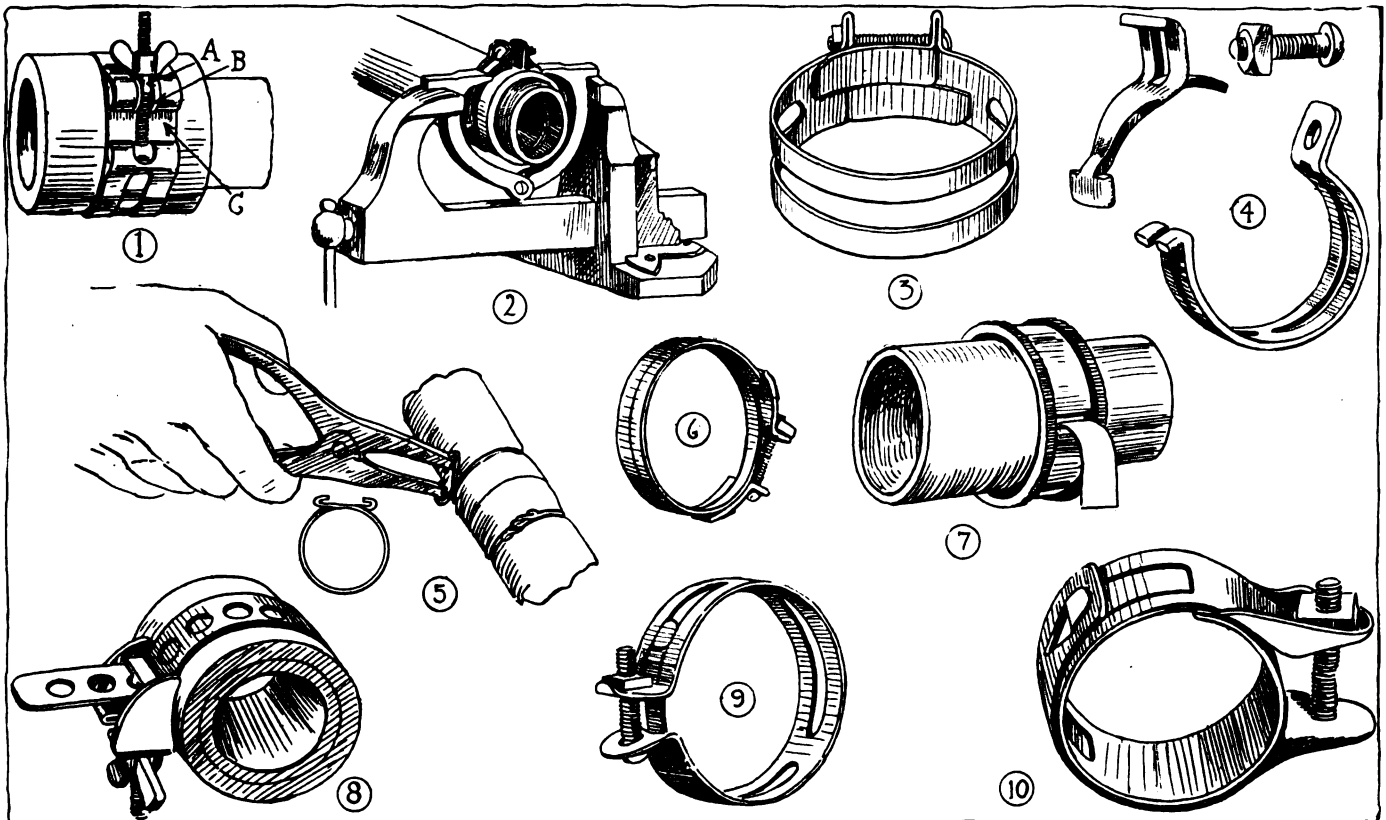
The Ideal bolted clamp is made of spring steel or brass in two parts; the band proper has one end formed as a bolt lug while the other is narrowed and the extremity hooked. The hook passes under the lug end and comes out through a slot in the band, forming an overlapping ring. The other part has an opening in one end which is caught on the hook, while the other end has a lug which, when the whole clamp is in position, comes opposite the first lug, when the bolt can be passed through. Price, for nicked steel and polished brass, per dozen, $\frac{3}{4}$ -inch, 60 and 80 cents; 1-inch, 70 and 96 cents; $1\frac{1}{4}$, 90 cents and \$1.20; $1\frac{1}{2}$, \$1 and \$1.50; $1\frac{3}{4}$, \$1.20 and \$1.60; 2-inch, \$1.40 and \$1.80; intermediate and larger sizes in proportion. The largest size is $2\frac{7}{8}$ -inch, at \$2.60 and \$3.30 per dozen.

The Perfect hose band is a sheet metal band which is applied with the aid of a special tool which pulls it tight, bends the end through a wire loop and locks it. Made in brass and nicked steel.

Price per 100 for hose up to $1\frac{1}{4}$ inches, \$1.40 in brass and 90 cents in steel; $1\frac{1}{2}$ to $2\frac{1}{4}$, \$1.80 and \$1.10; $2\frac{1}{4}$ to 3-inch, \$2.20 and \$1.30. The price of the tool is \$2.

Thompson

Two-piece Thompson hose clamps of galvanized steel, bolt tightened, are produced by the Newark Stamping Co., Newark, O.; only one model is made,



Half a score of hose clamps. (1) Catelain; (2) Sherman; (3) Crabbill; (4) Thompson; (5) Hudson; (6) Globe; (7) Herz tape-grip; (8) Morgan; (9) American; (10) Metal Stamping Co.'s clamp

and the sizes range from the $\frac{1}{2}$ -inch hose type to the largest. The main part of the clamp is about three-quarters of a circle and has at one end a bolt lug and at the other a slotted hook. The other piece has at one end a lug fitting the hook in the main piece, and at the other the second bolt lug; a tongue integral with the smaller part bridges the gap under the bolt. The clamp can be applied without taking off the hose, and can be used over and over.

Clamps for 1-inch hose, 60 cents per dozen, \$2.80 per 100; $1\frac{1}{4}$, 70 cents and \$3.50; $1\frac{1}{2}$, 80 cents and \$4.20; $1\frac{3}{4}$, 90 cents and \$4.90; 2-inch, \$1 and \$5.60; $2\frac{1}{4}$, \$1 and \$6; $2\frac{1}{2}$, \$1 and \$6.60. Dealers, 30 per cent.

A special Ford clamp is made in the same style in two sizes. For radiator outlet and inlet hose, \$1.20 for 25; \$4 per 100. For outlet hose, \$1.40 and \$5.

Rab

The Rab wire clammer, which is manufactured by R. A. Beaudette & Co., Chippewa Falls, Wis., is a special tool with which bands of ordinary wire of any size can be applied to hose. The tool consists of a steel shank slotted lengthwise and having a crosspiece, projecting on both sides, movable up and down the slot by a screw running through a wing-nut at the top of the tool. The opposite end, or foot, of the clammer is grooved.

To apply a clamp to a hose the wire is doubled, passed around the hose and the ends run through the bent part, as shown at A. With the grooved foot on the loop of the wire, the projecting wires are wound a turn or two around the ends of the sliding crosspiece, as at B, which is then drawn up with the wing-nut until the band is as tight as desired. By swinging the tool, as at C, the wire is bent across the loop; the ends are then cut off with a cutter attached to the tool and the projections pressed down out of the way. D is the finished job.

The price of the tool is 75 cents with wire cutter and 65 cents without; dealers, 45 and 50 cents; jobbers, 35 and 40 cents; 10 gross lots, 31 and 36 cents.

American

Galvanized steel hose clamps with a single bolt fastening and a tongue are made by the American Stamping Co., Battle Creek, Mich. A feature of this clamp is a nut lock, which consists of a small projection on one of the bolt lugs, which is bent over the nut.

Prices per 1,000, for 1-inch hose, \$37.50; $1\frac{1}{4}$, \$42.50; $1\frac{1}{2}$, \$47.50; $1\frac{3}{4}$, \$52.50; 2-inch, \$60. Special sizes for Fords, open diameter of clamp $2\frac{1}{4}$ inches, \$47.50, and $2\frac{1}{2}$ inches, \$60.

Globe

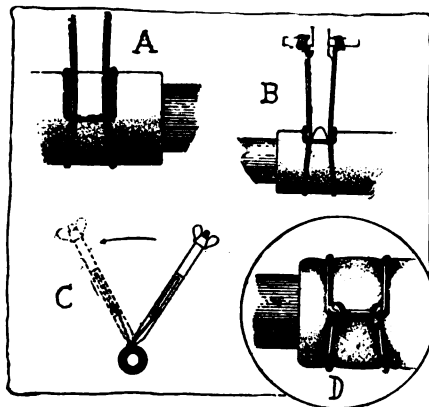
Two styles of hose clamps are manufactured by the Globe Machine & Stamping Co., Cleveland, O., one being new.

The older model is made in two parts, one being an inside piece of sheet steel which not only bridges the bolt gap but extends more than half way round the circle. A wing-nut is employed for tightening. The new model is made from flat spring steel wire which passes around the hose twice and has its ends hooked into the lugs which take the single bolt.

Price, old style, 1- and $1\frac{1}{4}$ -inch, \$1.50 per dozen; $1\frac{1}{2}$ - to $2\frac{3}{4}$ -inch, \$1.70; larger sizes, \$2; dealers, lots of 750, 75 per cent. New style, in lots of 5,000, for 2-inch outside diameter hose, about 1 cent each.

Crabill

Both steel and brass clamps are manufactured by the Crabill Hose Clamp Co., Battle Creek, Mich.; they are of the single bolt type with two tongues, one from each side.



The Rab wire hose clamp is applied with a special tool to hose of any size

Prices, 1-inch, brass, 50 cents per dozen, steel, 30 cents; $1\frac{1}{4}$ -inch, 60 and 40 cents; $1\frac{1}{2}$ -inch, 65 and 50 cents; $1\frac{3}{4}$, 70 and 55 cents; 2-inch, 90 and 60 cents; $2\frac{1}{4}$ -inch, \$1 and 70 cents; $2\frac{1}{2}$ -inch, \$1.20 and 80 cents.

Herz

The Tape-grip hose fastener produced by Herz & Co., New York, consists of a metal ring, the inside diameter of which is slightly larger than that of the hose on which it is to be used, and a piece of common tailors' tape. On the outer periphery of the ring are two knurled bands to afford a good grip for the hand and in the wall there is a slot the width of the tape. To apply the clamp the ring is slipped on the end of the hose, a flange preventing it from going all the way on, the end of the tape put through the slot and the ring turned by hand.

Friction between the tape and the hose is much greater than between the tape and the smooth interior of the ring, and the result is that as the ring is turned the tape is drawn in and coiled around the hose. After a few turns the space is completely filled, and by turning a little further the tape ring is forced down hard and tight. The tape is then cut and the ring turned till the end is covered.

Ordinary tape can be used, but a

special tape is made and sells for 10 cents per roll of 4 yards. Prices of rings, $\frac{7}{8}$ -inch, 20 cents each; 1-inch, 22; $1\frac{1}{8}$, 25; $1\frac{1}{4}$, 30; $1\frac{3}{8}$, 32; $1\frac{1}{2}$, 38; $1\frac{3}{4}$, 40; 2-inch, 45; $2\frac{1}{4}$, 48; $2\frac{1}{2}$, 50.

Sherman

Cast brass hose clamps are made by the H. B. Sherman Mfg. Co., Battle Creek, Mich. A single bolt is used and a tongue prevents wrinkling. Shoulders are formed back of the lugs to take the jaws of a tool for applying the clamps; the tool is designed to be placed between the jaws of a bench vise and presses the clamp home when the vise is tightened.

Prices of clamps, per dozen, for 1-inch hose, \$2; $1\frac{1}{4}$, \$2.50; $1\frac{1}{2}$, \$3; 2-inch, \$4; $2\frac{1}{4}$, \$6.50; $2\frac{1}{2}$, \$7.

Morgan

Several different types of hose clamps are made by the Morgan Mfg. Co., Newport, R. I. The 1915 type, which is made from stamped steel, has one bolt working through a nut which is shaped to conform to the lug against which it rests. The price is the same for all standard sizes, \$5 per 100; dealers, 50 per cent. Type 10 consists of a perforated metal band with one end fastened to a lug carrying a wing-nut in a slot; the other end of the bolt is T-headed. To apply the clamp the band is placed around the hose, the bolt, with nut off, passed through one of the holes, and the band drawn up till the bolt can be put in the slot in the lug, when the wing-nut can be replaced and tightened.

Prices, for hose $\frac{3}{4}$ to $1\frac{1}{8}$ inch, 12 cents each; $1\frac{1}{8}$ to $1\frac{3}{8}$, 15 cents; $1\frac{3}{4}$ to $2\frac{5}{16}$, 18; $2\frac{1}{4}$ - to 3-inch, 21. Dealers, 70 per cent. Other types also are made.

Hudson

The hose bands made by the Hudson Hose Mender Co., Melrose, Mass., are of brass or galvanized iron wire in a ring with ends hooked and overlapping. It is applied with a special plier, the jaws of which are separated when the handles are brought together. The band is placed on the hose and the ends of the plier jaws placed in the hooks. Pressing the handles together draws the band tight, and the tool is given a half turn, twisting the wire and locking it permanently.

Prices, brass, 1-inch, \$5.75 per 100; $1\frac{1}{4}$, \$6.50; $1\frac{1}{2}$, \$7.50; $1\frac{3}{4}$, \$8.50; 2-inch, \$9.50; $2\frac{1}{4}$, \$10.50; $2\frac{1}{2}$, \$11.50. Iron, 1-inch, \$3.25 per 100; $1\frac{1}{4}$, \$3.50; $1\frac{1}{2}$, \$4; $1\frac{3}{4}$, \$4.50; 2-inch, \$5; $2\frac{1}{4}$, \$5.50; $2\frac{1}{2}$, \$6. Pliers, \$1.40 per dozen.

In the description of the G. B. valve reseating tools sold by the G. B. Garage & Mfg. Co., Hempstead, N. Y., in the Before Show issue of Motor World, December 23, the dealers' discount was given as 35 per cent. This was an error, the goods being sold to dealers at net price less 5 per cent for cash.

From Credit to Cash in Advance in One Move

Montana Dealer Issues Coupons in Check-book Form and Others Have Taken it Up—Gives the Farmer 10% Discount

Frank E. Doran, Lewiston, Mont., distributor of the Dodge car through the Judith valley, in which this city is located, started a movement in his dealers and garage business last fall which is regenerating the motor car business around Lewiston and already its good effects are being felt in South Dakota, in Kansas and in a few other states.

Doran changed his garage business from a credit system to a cash-in-advance business in one broad jump. Early last fall he was carrying more than \$10,000 on his books, and as this is a farming country, where the farmers sell grain once a year, get their money once a year and spend it the remaining months, Doran saw that when accounts get beyond a certain age it was often necessary to take notes bearing 10 per cent interest in payment. He found it costs 10 per cent to collect these old accounts.

Make Farmer Pay in Advance

Doran's plan was to make the farmer pay in advance for everything, storage, gasoline, oil, garaging and repairs. To do this he conceived the idea of a coupon book containing \$25 worth of coupons, which he would sell to the farmers for \$22.50. This was giving the farmer a discount of 10 per cent in contrast with the farmer paying 10 per cent on notes. There is a big difference between paying an additional 10 per cent and getting 10 per cent discount. It is like paying 90 cents for a dollar article instead of \$1.10.

The farmer saw the scheme and liked it. The plan worked.

In a month 70 books were sold; in a word, Doran had collected \$1,575 in real cash for work he had not done. Instead of making collections six months or a year after doing the work, he was getting his money before the work was done.

To carry out his scheme Doran issued coupon books, Fig. 1, practically the size

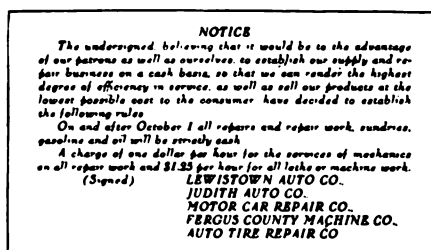


Fig. 5—Card announcing cash-in-advance policy which five Montana dealers have adopted

of a check book. In it are 13 pages of coupons divided as follows:

\$1 coupons.....	Fifteen
50-cent coupons.....	Ten
25-cent coupons.....	Ten
10-cent coupons.....	Fifteen
5-cent coupons.....	Twenty

The plate shows one of each of the different coupons. Each coupon bears the number "51" in red at one end, this being the number of this book. The reverse of each coupon, Fig. 2, shows what parts were purchased with each coupon redeemed, and there is blank

space in which the garageman can write on each coupon what service or merchandise it paid for, thus giving the garageman a complete record of the sale for the use of his bookkeeping department.

Book Is Its Own Contract

The first inside page of the book, Fig. 4, is really a contract between the garageman and his customer for the book. It is also a receipt for the \$22.50 paid for the book. Doran has made use of the inside front cover, Fig. 3, to list a few of the accessories he carries in stock, as well as outlining the kind of repairs he is prepared to carry out.

When Doran first announced his scheme other dealers in Lewiston ridiculed it. "Such a scheme will never turn the farmer over from a credit to a cash system," they said. But fortunately time has proved their error. Since then other Lewiston dealers have adopted the cash coupon system, as illustrated in Fig. 5, a reproduction of an announcement card which five local dealers are distributing far and wide throughout Judith valley. With all of them the coupons are good for everything except purchasing tires.

Allen to Make Own Motors

The Allen Motor Co., Fostoria, O., has taken over the business of the Sommers Motor Co., in Bucyrus, O., which has been making the motors used in the Allen cars.

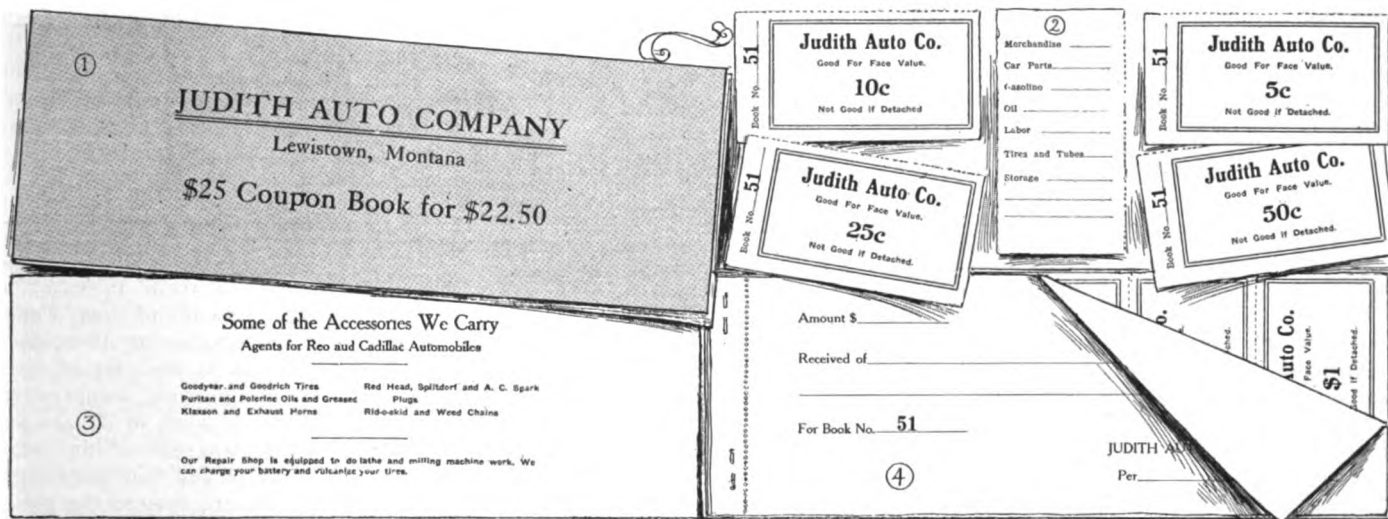


Fig. 1—Appearance of the check-book-like coupon book. Fig. 2—Reverse of a coupon showing spaces for a record of what the coupon pays for. Fig. 3—Inside of book cover used for a list of supplies carried in stock. Fig. 4—The front page is used as a receipt and is also the contract between seller and buyer

Tacoma's a Distributing Show

Many Pacific Northwest Dealers Show Cars—Retail Sales
Made and Dealers Signed Up—Grain Men Buy Cars

Sixty-five automobile and accessory dealers' exhibits completely filled the Glide rink at Tacoma during the second annual automobile show during the week of February 15. Instead of being strictly a Tacoma show this year, it was a great distributing show for the Pacific Northwest, dealers from both Portland and Seattle exhibiting with the Tacoma dealers. The show was under the personal management of A. L. Sommers.

A total of 42 pleasure cars were exhibited by 17 dealers, and three dealers exhibited trucks. Accessories were shown by the Automobile Supply Co., the booth containing an exhibit of Bosch magnetos. The Scott Machine Co. demonstrated the Master carbureter.

Among the dealers who made retail

sales during the show were the Griffith Motor Car Co., 14 Dodge cars; American Automobile Co., 8 Reos; Tacoma Motor Car Co., 8 Maxwells; Broadway Automobile Co., 1 Detroit electric; Winton Motor Car Co., 2 Wintons; Universal Motor Car Co., 5 Fords; Parker Motor Car Co., 3 Pullmans.

The exhibits of both the Green Motor Car Co., showing the new King eight, and the Griffith Motor Co., exhibiting the Dodge car, attracted special attention, both makes being newcomers to the Northwest and exhibited for the first time at the annual show. The Cadillac eight in the hands of Little & Kennedy of the Cadillac Auto & Supply Co., also proved a magnet.

Among the purchasers of cars were

many grain men, as the Northwest has received a large share of the returns from wheat and flour, both Tacoma and Seattle having exported many thousands of tons to Great Britain and the Orient during the past few months. The lumber business has been quiet for some time past, otherwise sales would have undoubtedly been doubled. However, the majority of exhibitors were well pleased with the treatment accorded them and the interest manifested by the large attendance each day, which varied from 500 in the afternoon to 2,000 each evening.

F. W. Vogler, Northwest Cole distributor, during the week appointed Rothweiler & Co., Seattle, as Cole agents in King county north of Auburn, and in the counties of Whatcom, Skagit, Snohomish and Kittitas. The Parker Motor Car Co., Seattle, secured as their Tacoma representative of Pullman cars Robert Watkins, of the Commercial Garage, and he in turn disposed of a half interest in his garage to A. H. Brown, of Chehalis, Wash. The Commercial Garage will distribute Pullman cars throughout Pierce county and appoint sub-agents.

Overland Dealer Gives 50 Hours Service With Each Car Owner Gets Card Entitling Him to \$37.50 Worth of Work

Fifty hours of free service with every Overland car sold in this territory, has been introduced by Bowman & Libby, Inc., Minneapolis distributors. F. W. Libby, treasurer of the company, says this new scheme in merchandising was introduced largely to get away from a few of the evils arising from salesmen working partly on commissions and who make sundry promises of service and free repairs in order to close a sale. Not infrequently these salesmen are gone three months after the sale is made, and from that time forward owners never tire of telling of the myriad promises of free assistance that was to go with the car.

Records All the Details

The 50-hour-free-service card, Fig. 1, is a part of the bargain entered into when the car is sold. It is as much a part of the bargain as getting a windshield, top, or speedometer. These 50-hour service cards are numbered serially, that reproduced here bearing number 901. On the card are recorded all details relative to the car purchase, owner's name, address, car model, date and serial number of car.

The reverse side of the card contains the standard 90-day warranty of the maker covering materials used, workmanship, etc.

This 50-hour-service card represents \$37.50 value to Bowman & Libby, Inc., or any other distributor using the system. This is based on repair time valued at 75 cents per hour. The card is punched whenever service is given. Across the top are forty 15-minute periods. For 15 minutes' work on a tire rack one period is punched. After these

value of \$37.50 and appeals to the buyer in this light. But better still, it gets away from rash promises; it avoids wrong impressions by the salesman. The card being a part of each sale, the question of free service becomes a part of the written contract between the buyer and the firm making the sale. By it free service is defined in dollars and cents.

Its greatest merit lies in its ability to eliminate complaints. With it the buyer has a definite promise; he knows the boundary of free repairs or free attention. The card is a regular reminder to him that after a certain time he will be responsible for his own repairs. It does away with any hoped-for free repair system as long as the car continues to run. It is a bargain.

Has a Good Effect

The card has a good effect on car owners, stimulating them to care for their cars. It is to some of them a daily bookkeeping system, giving them their elementary lessons in the cost of operating a car. Many a car owner never realized how much work in dollars and cents the dealer was giving him when he simply drove in and had some work done. With the card system the owner sees each job calculated into hours or fractions and can readily see these hours converted into dollars and cents.

FIFTY HOURS LABOR FREE OF CHARGE																																							
<div> <div>1/4 Hours</div> <div>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20</div> </div> <div> <div>1/2 Hours</div> <div>21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40</div> </div>																																							
BOWMAN & LIBBY, INC., MINNEAPOLIS																																							
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Address																																							
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Model																				Serial No.																			
OVERLAND SERVICE CARD																																							
<div> <div>21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40</div> <div>41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60</div> <div>61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80</div> </div>																																							
WITHOUT THIS CARD CASH PAYMENT IS REQUIRED																																							
NOT TRANSFERABLE																																							

Fig. 1—Time is punched out of card when work is done. Without the card, cash must be paid for repairs

15-minute periods come eighty 30-minute periods to be punched the same way when work is done.

Cash Value of \$37.50

In its practical working out Libby says this card has not a few virtues. It is a tangible evidence of service to the buyer. It is more than an oral promise of free repairs. The card has an actual cash



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Strength of Organization

THE WORDS of John Stuart Mill, the eminent economist, can be taken as a basic reason why we should have more unanimity of action among motor car dealers, and more and better organizations for mutual advancement and protection.

"Almost all of the advantages which man possesses above the inferior animals arise from his power of acting in combination with his fellows, and of accomplishing by the united efforts of numbers, what could not be accomplished by the detached efforts of individuals."

This is the complete story. It is a story as old as the hills, told in terse language; a story that is just as applicable to motor car and motor accessory dealers as to bankers, doctors, lawyers, manufacturers or other business men. It is telling in other words the old story, "In union there is strength."

Dealers' Organizations Essential

If organization is essential in other industries, it is essential in selling motor cars. Our motor car manufacturers have had their national organizations since the early days of the industry. These organizations have worked very material good. They have aided in solving patent problems; they have aided in promoting good roads movements; they have aided one another in credits; they have been of general good.

If our manufacturers of cars and accessories need organizations, then why not our thousands of dealers engaged in merchandising the cars, the trucks and the accessories? We have had local organizations in many cities, organizations that have been more or less

active for years. Today there is a demand for something more than city organizations; the state and the territorial organization is needed. The dealers in a dozen cities must lend their united efforts to accomplish a movement for the general good of the state. This state organization movement is growing.

Get New Englanders Together

After the state organization movement comes that of territorial organization. The uniting of dealers in a territory with common interests was started west of the region of the Great Lakes over a year ago. It is being taken up in the great Mississippi valley.

Why not a general get-together of all New England dealers?

New England has been looked upon as one of the most clearly defined motor car selling territories in the country. It is one section that has maintained its unity, whereas in the western sections large territories have been divided and subdivided. It is not so with New England. This remains a united section.

New England dealers have many problems in selling and maintaining cars that are common to dealers in Massachusetts, Connecticut, Rhode Island, Maine, New Hampshire and Vermont. They are one as a field, they are one in the problems to be met. Then why not one as an organization of merchants selling motor cars and accessories?

The great majority of the New England dealers meet annually during the week of the Boston show. They come to study cars, to close agencies, and to conduct other business. Why should not one half day and one evening of this show week be given over to a dealers' convention, where they could meet one another face to face, get better acquainted, and learn from one another how to solve problems?

Rise by United Effort

Dealers from one section of a country meeting dealers from other sections invariably compare notes. One finds out how the other keeps up his cash repair business. Another is interested in a new system of contract estimates on repair jobs. Another wants to know how to make money on the sale of gasoline. With another it is the problem of placing a value on used cars. There is literally no end to the questions.

A dealers' convention is the logical answer to it. Adopt the policy of Mill; accomplish by united effort what you cannot accomplish by individual effort. In proportion as you follow this rule will you rise to higher levels in business; will you adopt improved systems of keeping record of your business; will you cut out the leaks in sales; will you master the problem of free service; will you solve the question of trades and price cutting, and will you become the real master of your business.

A dealers' organization should be formed by dealers, constituted for dealers, and managed by dealers, for their own benefit.

STANDARD OIL ASSERTS BOILING IS BEST TEST

Begins Educational Campaign Against Gravity Reading as Indication of the Desirability of Gasoline

What determines the quality of gasoline? What characteristic indicates its ability to vaporize easily, to burn quickly without leaving carbon deposit, and to have an everlasting kick in it?

The dealer, the garageman and the user all have been educated up to the belief that this vital indicator is specific gravity; that a high gravity gasoline is good gasoline and that low gravity gasoline is not so good.

But the Standard Oil Co. says this is all wrong. And in support of its contention it has entered upon a campaign to educate the public to gauge its fuel not by specific gravity, or rather Beaume, but by boiling point instead. The first gun in the campaign sounded recently when an almost inconspicuous "reader" appeared simultaneously in a number of newspapers throughout the country. This was labeled "S. O. Gasoline Reader No. 1," which would indicate that it is to be followed by other readers of a similar nature.

This "reader" points out: (1) That gasoline of low gravity really is more desirable than gasoline of high gravity because it contains a greater number of heat units and therefore has more latent power, and (2) that boiling point is the only true test of the quality of gasoline intended as fuel for internal combustion engines.

With the first of these contentions the independent producers would seem to have no quarrel; they do not attempt to controvert this physical fact. But they are by no means agreed that boiling point—in the particular way in which it is referred to by the Standard Oil company—can be used as an accurate indication of the quality of fuel.

The independents point out, for example, that the initial boiling point and the final boiling point are entirely different factors and that both should be used as a gauge of quality. These two temperatures should be nearly equal, state the independents, to indicate that gasoline is of good quality. And this contention is upheld by the Standard, which states in its "reader": "The first requisite of a motor fuel is that it be a homogeneous, straight-distilled product." This means the gasoline which is obtained from a straight cut of one fraction of the crude during the process of distillation. In other words, it is impossible to obtain a truly homogeneous mixture by adding high gravity gasoline to

low gravity gasoline in order to raise the average gravity.

It is pointed out by the independents that there is no difficulty in obtaining a low initial boiling point with "blended" gasoline of this kind. But when gasoline is blended, the lighter fuel is used up first and the residue contains a certain percentage of heavy oil and carbon, the first causing difficulty in starting and the last causing deposit. It is the presence of these heavier fractions which raises the final boiling point. From this it becomes clear that both the final boiling point temperature and the initial boiling point temperature should be used as a gauge.

The Standard Oil Co. states that typical figures for average motor fuel would be an initial boiling point of 110 deg. Fahr. and a final boiling point of about

USED CAR QUOTATION	
M. _____	
FOR YOUR _____ CAR	
MODEL _____	YEAR _____ I HEREBY
OFFER YOU \$ _____ AS AN ALLOWANCE IN	
TRADE FOR MODEL _____ BUICK	
GOOD FOR THIS DAY AND DATE ONLY _____ 191_____	
O. W. HIATT	
BY _____	
THIS IS PUBLIC INFORMATION	

Upon this card Hiatt writes what he will pay the car owner for his used vehicle

340 deg. Fahr. These are for "straight distilled" gasoline. "Blended" gasoline may boil at as low a temperature as 70 or 80 deg. Fahr., but the final boiling point likely will be as high as 500 deg.

Lower Liability Rates March 1

The automobile committee of the Workmen's Compensation Service Bureau has completed the work of revising the automobile experience furnished by individual companies and as a result new schedules of liability rates for pleasure cars will be issued at once and will become effective March 1. These will be effective throughout the country, except Chicago, where new rates went into effect Monday of this week. These are the same as the old rates for cars up to 20 horsepower and on higher horsepower reductions of from \$1 to \$10 from the former manual have been made. New rates for commercial vehicles for the whole country, except the following cities, will be issued later: New York, Chicago, Boston, Providence and St. Louis. Property damage and collision insurance rates are unchanged.

Three More Non-Gran Users

The American Bronze Co., Berwyn, Pa., has added three more names to the list of users of Non-Gran bearing metal. These are the Haynes Automobile Co., Kokomo; Dorris Motor Car Co., St. Louis, and the Lange Motor Truck Co., Pittsburgh.

PUTS HIS TRADE PRICES DOWN IN PLAIN FIGURES

Kansas City Buick Man Takes Step to Check Exaggeration by Owners Who Shop Along Automobile Row

Furnishing written quotations on offers made for used cars, when offered in trade for new machines, is a new movement in the used car field in Kansas City which has been started by O. W. Hiatt, retail sales manager of Buick cars in that city.

Hiatt, who is unusually well versed in all the angles of taking used cars in part payment for new ones, has introduced a blank form, Fig. 1, which he fills out and gives to every prospect offering a used car in part payment for a new one. The blank has spaces for the name of the car, year of manufacture, model, and also for the exact amount that Hiatt or his salesman will allow on the deal. Further, the blank states that this offer is good for this date only, which eliminates the possibility of its being used when prices may have changed.

The object of this card is to stamp out not a few of the abuses of taking used cars in trade. Frequently the prospect goes from store to store stating how much other dealers will allow him on his old machine. Not infrequently these price allowances are greatly exaggerated. The card system eliminates this. Any dealer when talking to a prospect who claims to have been offered, say \$800, for his car by Hiatt, can ask to see the card furnished, and which would plainly state such information.

It is thus expected that this card system will serve as an excellent check on misrepresentation of this nature. The plan has just been introduced and it is expected that several other Kansas City dealers will take up the movement. The use of this card, together with the Used Car Central Market Report should greatly assist dealers in coping with the used car situation.

Chandler Increases Sales Force

Increasing business has made it necessary for the Chandler Motor Car Co. to add more men to its sales force. The sales territory has been divided into two sections, each with an assistant sales manager at its head. W. G. Clay has been appointed in charge of the Eastern district and Sid Black in charge of the Central District. F. G. W. Sudrow, formerly sales manager of the Marion Motor Car Co., and Benjamin Rennard have been appointed special factory representatives.

Value of 94,000 Thousand-Dollar Cars in Western Granaries

Big Four States of Southwest to Buy Heavily This Year —Corn, Wheat and Animal Industry Controlling Factors

THERE are four great economic matters that will have a bearing on the ability of the big grain and stock states of the Southwest to continue to increase their purchase of motor factory products this summer and fall as they have in the past. These are:

1—The price the winter wheat crop still on hand continues to bring.

2—The acreage and condition of the winter wheat crop (now in the ground) that will be harvested the middle of this summer.

3—The size of the coming corn crop.

4—The livestock situation as affected by the quarantines that have resulted from the outbreaks of the foot and mouth disease.

After a careful investigation among western bankers, grain associations and livestock men, it is apparent that Kansas, Missouri, Oklahoma, Nebraska—the big four of the Southwest—will not only continue to buy motor cars, but should continue to show an increase in buying. The other grain and stock states of the Mississippi and Missouri valleys will show the same general conditions, with certain variations, for example, in northern states where spring wheat is the heavy crop instead of winter wheat.

Buying Cars on 1914 Wheat

The Southwest has bought motor cars and is still buying motor cars on the winter wheat that was harvested last summer. Still in Kansas, Nebraska, Missouri and Oklahoma, it is estimated by grain men that there remains nearly 20 per cent of that crop. Some of it is going to market gradually, some of it will be held until the new crop is close by. But the farmer himself right now is getting for all he is selling between \$1.40 and \$1.50, depending on his location.

What he may get if he holds on to the fifth of the crop he still has in his bins, of course, depends on war conditions. Indications are this week that he is holding pretty well, too. The exporters are sending grain that is in second hands and the farmers are sending less of their crop to market than they were at this time a year ago. Figuring \$1.40 a bushel (to be conservative), there is in the farmers' bins in Kansas, Nebraska, Oklahoma and Missouri this much wheat worth as follows:

With the high price of grain bringing into the limelight the grain producing sections of the world, Motor World plans to publish a series of monthly industrial reviews—of which this is the first—on that great southwestern territory which embraces such states as Missouri, Kansas, Nebraska and Oklahoma.

These states possess today an enormous car-buying power. The farmers in the four states named have still in their granaries \$94,401,880 worth of grain, which would buy 94,000 \$1,000 cars.

The author of these reviews is one of the best authorities on this section; he has watched the growth of these states for 25 years and is daily in close contact with the leading industrial and agricultural phases of this section of country.

State	Bushels	Value
Kansas	36,260,000	\$50,764,000
Nebraska	13,623,200	18,072,480
Oklahoma	9,595,000	13,433,000
Missouri	8,666,000	12,132,400
Total	68,144,200	\$94,401,880

The farmers apparently are so comfortable that they are in no hurry to sell this wheat. A large part of that is surplus, and surplus spells motor everywhere. Enough wheat left over to buy 94,000 thousand-dollar cars in these states alone!

The winter wheat now in the ground is greater than a year ago with the exception of that in Kansas.

The report, with the exception of Nebraska, was not so good compared with the year before, but since that time conditions in both Kansas and Oklahoma have greatly improved. The war is still on. Kitchener says it will last three years. These great wheat states are prepared. Appended is a table on the winter wheat crop (now in the ground).

Corn is a great crop in these four great Southwest states. The corn crop

means fall buyers. The preliminary condition is first class. The corn belt has had moisture and lots of it this spring and the indications are that the ground will be in prime shape for planting, a matter of no small consequence when the farmer is figuring the chances for his crop.

The animal industry is a trifle less pleasant to view at this time. Cattle only are affected by the quarantines established by the government and states because of the foot and mouth disease. At this time only Kansas and Missouri are open to stocker and feeder—breeding cows and cattle to be fed—shipments. There is a tendency, however, on the part of large stockmen and bankers handling cattle paper to view the slowing up of cattle shipments to market with equanimity. W. T. Kemper, president of the Commerce Trust Co., Kansas City, which handles much cattle paper, says regarding this:

Stock to Show Gain

"The drouth in Kansas, Nebraska, Oklahoma and Missouri, 2 years ago, took thousands of head of cattle out of these states as well as out of New Mexico and Texas. It shortened the breeding stock on the farms and ranches. The stock cattle that the Southwest does not ship to market this winter will be ready for market in the fall, and where there was then a cow, in the fall there will be a cow and also a calf. The quarantine won't hurt, it will help to restock the Southwest, and it's a creation of a new wealth in a very few months."

Adding to the interest of the man who makes motor cars is a look into the general wealth of the farm producers in the big grain and stock raising states. For example, take the value of all farm produce in the United States. Without

WINTER WHEAT NOW IN THE GROUND IN FOUR STATES*

State	Area Sown		Condition, Dec. 1.			
	Autumn 1913 Acres	Autumn, 1914 Compared with 1913 Per cent.	Total Preliminary Acres.	1914 Per ct.	1913 Per ct.	10-Year Average Per ct.
Missouri	2,585,000	110	2,844,000	87	98	99
Nebraska	3,464,000	105	3,637,000	90	86	93
Kansas	8,958,000	98	8,779,000	80	100	90
Oklahoma	2,577,000	120	3,092,000	83	103	87

* From the Farmer's Bulletin, 645, United States Department of Agriculture.

the 2,828 million dollars for animal products, the total compiled from the 1914 figures of the Department of Agriculture is 6,044 million. In five states of the Southwest this year the value of thirteen field crops, corn, wheat, oats, barley, rye, buckwheat, flaxseed, rice, potatoes, sweet potatoes, hay, tobacco and lint cotton, is \$1,113,036,000. This means, of course, that most of it is in wheat and corn, excepting Texas, where cotton counts, although cotton prices this year put Texas lower than the five-year average. Here are the five states:

Value of Thirteen Crops

State	1914	Five Yrs. Avg.
Kansas	\$287,662,000	\$164,844,000
Texas	288,335,000	336,725,000
Nebraska	210,099,000	153,869,000
Missouri	192,981,000	188,689,000
Oklahoma	134,159,000	117,618,000

And this does not include the crops of Minnesota and the Dakotas. Of course, there is duplication to a certain extent in the department figures, caused by the fact that it is hard to say what part of the value of animals is made up of hay and grain fed. However, it is sufficiently close to cause amazement at the comparison that may be made between the total of these five states and the entire country on farm products.

The banks as a barometer of business conditions in the Southwest make a good showing. Money is easy and abundant in the banks of Kansas City as well as all of its trade territory. December 31, the date of the last call on the national banks, the Kansas City banks showed deposits of 110 million, which was 9½ millions in excess of the same time last year. It is estimated that since that call the deposits in Kansas City national banks have increased to 118 millions. The bank clearings show an increase of from 25 to 45 per cent as compared with the same time last year.

Jitney Business Is Growing

The next week or two probably will see tremendous strides taken in the jitney business and tremendous efforts as well to put the jitney out of business. In Kansas City there has been a steady increase in the number of machines operating. Last Saturday, always a big transportation day, the jitneys in Kansas City handled 40,000 to 50,000 passengers. This meant from \$2,000 to \$2,400 was cut off of the Metropolitan Street Railway receipts that day. Other days of the last week probably saw a reduction in street car fares of \$1,000 to \$1,500.

E. K. Carnes, traffic manager of the jitney station, estimated that 225 cars were engaged on the Saturday trips and that of this number about fifteen were buses, seating from eight to twelve passengers. The jitney carried the strap-hangers down in the morning, and on account of the large number of Saturday shoppers coming down in the early

afternoon and going home before the rush hours, kept busy all day.

It is still too early to figure the outgrowth from this jitney business, whether it will be transformed into a bus, seating from eight to ten persons, or whether the small five-passenger cars will continue to do a large part of the business. Jitney buses seem to have a clear profit when they report fares averaging \$16 a day. However, the \$8 average of the small touring cars, in the estimation of local dealers, will pay good wages to the owner of a small car and take care of his expenses and the depreciation of his vehicle.

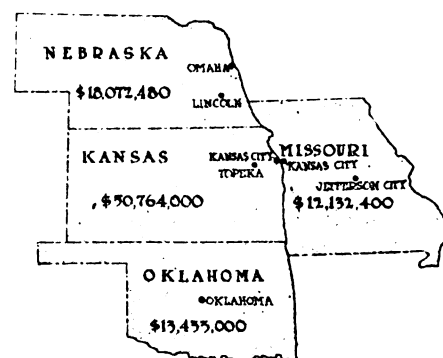
The big question that is affecting the jitneys is the preparation of ordinances in western cities to regulate them. The street railway influences are strong and not stronger elsewhere than here. Telegrams from coast cities and Texas cities where the jitneys are thriving say that to date no ordinances have been adopted, but that the jitney drivers and their patrons are watching every move of the street railway interests to put them out of business by the demands for liability bonds and heavy license fees. In Kansas City the street railway has appealed to friends in the city government which recently granted a 30-year street railway franchise. The ordinance will be taken up in council committee this week and the first week in March will probably see some sort of regulation. The city counselor's office, it is feared by the jitneys, will force a \$10,000 liability bond for each car and a \$10 license fee with a \$5 occupation tax.

Bond Looks Menacing

Of this the bond is the most serious, as the jitney livery business will be put as a high risk by the insurance companies, if it is bonded at all; this in view of the fact, too, that the street railway company has not paid a damage claim in 5 years as a result of its receivership. It has been unable to finance its new franchise on account of the war and the indications are that the jitneys will keep it in a receivership for a while longer. Just how serious a view the street car companies are taking of the jitneys may be had from this abstract from the United States Investor:

"Meeting with the popular approval as this jitney business has, if a movement is made to suppress them, some form of popular referendum will be invoked. The sentiment of the West does not furnish a very cheerful outlook for the street railway companies. The street railway companies are face to face with one of the greatest problems they have ever been called upon to face."

The United States Investor is friendly to the street car companies. It warns them of what to expect and is it not to be expected that the street car companies will turn every stone to put this new



In the granaries of four southwestern states is grain which is the equivalent of 94,000 cars at \$1,000 each

competing motor industry out of business?

With the close of the motor car show, it is possible to make comparisons with the show last year. The paid attendance showed an increase this year of 39 per cent over last year and 75 per cent over the 1913 show. The total attendance was 140,000. The show committee has always kept the amount of money actually taken in a secret, but it is understood that the paid admissions amounted this year to \$21,000.

Hall Too Small for 1916 Show

As all of the proceeds of the show go to finance the show of the succeeding year, 1916, will see a demand for space that Convention hall with its 50,000 square feet will not be able to take care of. The directors of the dealers' association are planning the installation of a second balcony. This year the first balcony and the corridors that entirely surround the arena floor were crowded.

The secretary, E. E. Peake, estimates that 2,400 dealers, many of them accompanied by prospective buyers, visited the show this year, but it was remarked by one of the biggest factory men in the popular priced line that his company had sold fewer cars to dealers than ever before because the dealers had not waited for the show to sign their contracts. So satisfied are the dealers with the retail motor outlook in the agricultural states that they are able to order months ahead of the show.

Service Stations Added by Bosch

The Bosch Magneto Co., New York, has added the following to its list of service stations:

Joseph H. Walsh, Jacksonville, Fla.; Carter & Stukey, Logansport, Ind.; Geo. B. Carter, Petersburg, Va.; Jackson & Harrison Co., Elyria, O.; Geo. A. Fortin, Kankakee, Ill.; Harry A. Scott, Kalamazoo, Mich.; Reliance Electric Co., Norfolk, Va.; Frank Dudgeon, Jr., Glen Cove, N. Y.; C. E. Whitten, Lynn, Mass.; George C. Wilderman Co., Parkersburg, W. Va.; Koebel-Bennett Auto & Supply Co., Muskegon, Mich.; Casper Machine Shop & Garage, Casper, Wyo.

Boston Exhibitors' List Contains 316 Names

Mechanics' Hall to Be Well Peopled For Hub Dealers' Thirteenth Exhibition, March 6-13—Both Cars and Trucks.

Following is a complete list of exhibitors up to date for the Boston show, which opens Saturday, March 6, and will close March 13:

Name	Address
Abbott Motor Co.	Detroit
Abrams Co., Myer	Cambridge
A. C. C. Oil Co.	Boston
Adalian Bros.	Boston
Ahlberg Bearing Co.	Boston
Ajax Trunk and Sample Case Co.	New York
Albany Lubricating Co.	New York
American Motor Equipment Co.	Boston
American Storage Battery Co.	Cambridge
Anderson Electric Car Co.	Boston
Andover Motor Vehicle Co.	Andover
Arnold Co.	Boston
Arnold, N. B.	Brooklyn, N. Y.
Atherton, Inc., C. F.	Boston
Atterbury Boston Co.	Cambridge
Atwood, J. H. & G. L.	Boston
Autocraft Co.	Cambridge
Automatic Appliance Co.	Boston
Automatic Time Stamp Co.	Boston
Automobile Legal Assn.	Boston
Autocar Sales & Service Co.	Boston
Allen Motor Co.	Fostoria, O.

Barnstead Water Still Co.	Boston
Bailey & Co., Inc., S. R.	Boston
Batchelder-Gallant Co.	Boston
Beacon Motor Car Co.	Boston
Boston Blacking Co.	East Cambridge
Bowman Co., J. W.	Boston
Bowser & Co., Inc., S. F.	Boston
Boyce Co.	New York
Boyd, F. Shirley	Boston
Braender Rubber & Tire Co.	Rutherford, N. J.
Brock Rubber Co., A. S.	Boston
Buick Boston Co.	Boston
Briggs-Detroit Co.	Detroit
Briscoe Motor Co.	Jackson
B. & R. Shock Absorber Co.	Philadelphia

Cadillac Auto Co. of Boston	Boston
Caldwell, John	Boston
Campbell Co., A. S.	Boston
Canterbury, Inc., Geo. W.	Boston
Cape Cod Power Dory Co.	Wareham, Mass.
Carr, George E.	Boston
Chalmers Motor Co. of Mass., Inc.	Boston
Champion Spark Plug Co.	Toledo
Chandler Motor Car Co. of Boston	Boston
Charles Motor Co.	Boston
Chevrolet Motor Co. of N. E.	Boston
Class Journal Co.	New York
Cole Motor Co. of Boston	Boston
Commerce Motor Car Co.	Detroit
Connell Co., W. J.	Boston
Connell & McKone Co.	Boston
Co-Operative Mfg. Co.	Boston
Chase Motor Truck Co.	Syracuse
Cincinnati Pulley Machinery Co.	Cincinnati
Clincher Tire Plow Co.	Detroit
Collins Co., M. F.	Boston
Columbia Tire & Top Co.	Boston
Copithorn Rim & Tire Co.	Boston
Cotton, Inc., L. M.	Boston
Continental Asbestos Corp.	Worcester
Cordtmeier, F. H.	New York
Corey & Smith	Worcester
Coward Auto Supply Co.	Boston
Cox & Co., Inc., A. W.	Cambridge
C. R. G. Mfg. Co.	Boston
Cunningham, Son & So., Jas.	Boston
Curtis-Hawkins Co.	Boston
Cut Price Auto Supply Co.	Boston

Davis Mfg. Co., D. L.	Chicago
Dayton Tire Co.	Boston
Disco Electric Starter Co.	Detroit
Dodge Sales Co.	Boston
Doman & Grasse	Cohasset, Mass.
Donovan Motor Car Co.	Boston
Dreadnaught Tire & Rubber Co.	Boston
Dujardin Rubber Co., Inc.	New York
Dunlap-Brown Oil Co.	Boston
Dutton Motor Co., Inc., F. A.	Somerville, Mass.
Dixie Tire & Rubber Co.	Boston
Dort Motor Car Co.	Flint, Mich.

Eads & Lowd	Boston
Eagle Oil & Supply Co.	Boston
Eastern Oil Tank Co.	Lowell
Eastman Spring Co.	Waltham
Eisner-Lenk Co.	Boston
Ellis-Ward Co.	Boston

Enger Motor Car Co.	Cincinnati
Enterprise Rubber Co.	Boston
Excelsior Motor & Mfg. Co.	Chicago
Evinrude Motor Co.	Detroit

A. Farmer & Co.	Holderness, N. H.
Farrington Mfg. Co.	Boston
Farrington, P. K.	Boston
Federal Motor Truck Co.	Detroit
Fiat Motor Sales Co.	Boston
Flentje, Ernst	Cambridge
Flint Motor Parts Co.	Providence
Forbes, Walter J.	Boston
Ford Co., Percy	Boston
Ford Motor Co.	Boston
Forest City Electric Co.	Cleveland
Franklin Motor Car Co.	Boston
Frazier Co., M. Abbott	Boston
Fryer Co., Chas. H.	Providence
Fuller, Alvan T.	Boston

Garford Co.	Elyria, O.
General Electric Co.	Schenectady
General Vehicle Co.	Cambridge
Gilmore Co., E. A.	Boston
Gilmore & Co., R. J.	Philadelphia
Gordon Rubber Co.	Canton, O.
Grant Motor Co.	Findlay, O.
Green & Swett	Boston

Haberer & Co.	Cincinnati
Hassler Shock Absorber Co.	Indianapolis
Havoline Oil Co.	Boston
Henderson Motorcycle Co.	Detroit
Harding, W. A.	Boston
Harding Distributing Co.	Boston
Hart Co., A. T.	Boston
Haynes Automobile Co.	Kokomo
Heald Machine Co.	Worcester
Henley-Kimball Co.	Boston
Henshaw Motor Co.	Boston
Herff-Brooks Corp.	Indianapolis
Hersey, Paul C.	Boston
Highland Body Mfg. Co.	Cincinnati
Hillman Auto Supply Mfg. Co.	Boston
Holt & Beebe Co.	Boston
Houk Co., George W.	Buffalo
Holt-Welles Co., Inc.	New York
Hudson Motor Car Co.	Detroit
Hunt, Edward C.	Norwood, Mass.
Hupp Motor Car Co.	Detroit
Hydraulic Oil Storage & Eng. Co.	New York
Howe Rubber Co. of Boston	Boston
Hub Motorcycle Co., Inc.	Boston

Imperial Motor Car Co.	Boston
Indian Refining Co.	Boston
Interstate Motor Co.	Muncie, Ind.
International Harv. Co. of Am.	Somerville, Mass.

Jackson, Chas. A.	Boston
Jackson Co., Charles A.	Boston
Jackson Motor Car Co.	Boston
Jager Engine Co.	Boston
Jeffery Co., Thos. B.	Kenosha
Joyce, Elizabeth A.	Boston
Justice & Co., A. R.	Philadelphia

Keating & Decker	Newton, Mass.
Kelleher, J. J.	Dorchester
Kelly-Springfield Motor Truck Co.	Cambridge
Kemco Electric Mfg. Co.	Cleveland
King Motor Car Co.	Boston
Kissel Kar, N. E. Branch	Boston
Knapp Motor Car Co.	Lebanon, N. H.
Knox Motors Co.	Boston
Krit Motor Car Co.	Detroit
Koehler Sporting Goods Co., H. J.	New York
K. W. Ignition Co.	Cleveland

Lake Sales Co.	New York
Lee Tire Sales Co.	Boston
Leeffe, H. Ewald	Boston
Lenox Motor Car Co.	Boston
Linscott Motor Co.	Boston
Lippard Stewart Motor Car Co.	Cambridge
Locomobile Co. of America	Boston
L. P. C. Motor Co.	Racine

Magnus, M. E.	New York
MacAlman, J. H.	Boston
Maddocks Co., Inc., H. Ross	Boston
Maquire Co., J. W.	Boston
Mais Motor Truck Co.	Indianapolis
Malton Specialty Co.	Boston
Marathon Tire & Rubber Co.	Akron
Martini & Huenke Co.	New York
Mass. Mutual Auto Co., Inc.	Boston
Master Carburetor Sales Co.	Boston

National Tire & Rubber Co.	Boston
Max Machine Co.	Clinton, Mass.
Maxim Motor Co.	Middleboro, Mass.
Maxwell Motor Co., Inc.	Detroit
McFarlan Motor Co.	Connersville, Ind.
McQuay-Norris Mfg. Co.	St. Louis
Metz Co.	Waltham
Meyers Bros.	New York
Micro Piston Ring Co.	New York
Midgley Tire & Rubber Co.	Lancaster
Milburn Wagon Co.	Toledo, O.
Miller, Chas. E.	New York
Miller Rubber Co.	Boston
Mitchell-Lewis Motor Co.	Racine
Mitchell & Smith, Inc.	Boston
Moline Automobile Co.	East Moline
Montello, V.	Medford, Mass.
Moore Smith Co.	Boston
Moreton, W. H.	Boston
Morse, Alfred Cutler & Co.	Boston
Motor Parts Co.	Boston
Motor Supply Shop, Inc.	Boston
Motor Vehicle Pub. Co.	New York
Mulherin, V. J.	Boston
Murray & Co., P. A.	Newton
Miami Cycle & Mfg. Co.	Middletown, O.

National Highway Assn.	Cambridge
National Motor Vehicle Co.	Indianapolis
New England Motorcycle Co.	Boston
New England Truck Co.	Fitchburg
New York Lubricating Oil Co.	Boston
Nordyke-Marmon Co.	Indianapolis
Northern Engineering Works	Detroit

Oakland Motor Co.	Boston
Olds Motor Works	Lansing
Orono Mfg. Co.	Boston

Paterson Co., W. A.	Flint
Packard Motor Car Co.	Detroit
Paige Motor Co. of Boston	Boston
Peacock & Co., Clarence N.	New York
Peerless Motor Car Co.	Cleveland
Perkins-Campbell Co.	Cincinnati
Picard & Co., A. J.	New York
Pierce-Arrow Motor Car Co.	Buffalo
Platt & Washburn Refining Co.	Boston
Pope Hartford Co. of Boston	Boston
Pope Mfg. Co.	Westfield, Mass.
Premier Motor Car Co. of N. E.	Boston
Pressure Proof Piston Ring Co.	Boston
Presto Inter-Rim Co.	Boston
Pullman Motor Car Co.	York, Pa.
Pyrene Co. of N. E.	Boston

Randall Co.	Quincy
Rand, H. L.	Worcester
Rauch & Lang Carriage Co.	Cleveland
Reed-Crocket Co.	Boston
Regal Motor Car Co.	Detroit
Republic Motor Truck Co.	Alma, Mich.
Reynolds Oil & Supply Co.	Boston
R. I. V. Co.	New York
Rose, Peter R.	Boston
Renault-Freres Selling Br., Inc.	New York
Reo Motor Car Co.	Lansing
Robinson Co., C. A.	Boston
Robinson Fire Apparatus Mfg. Co.	Boston
Robinson & Son Co., Wm. C.	Boston
Rockwell, Inc., C. P.	Boston
Rowe Motor Mfg. Co.	Downington, Pa.
Russell Co., W. L.	Boston
Rutherford Rubber Co.	Boston

Salman, John A.	Boston
Sanders-Wilson-Barnaby, Inc.	New York
Sani-Mist Co.	Hartford
Saxon Motor Co.	Boston
Scott & Co., Ltd.	Boston
Scrannage, Lawrence E.	Medford, Mass.
Scripps Booth Co.	Detroit
Scudor Mfg. Co.	Lowell
Service Motor Car Co.	Wabash, Ind.
Sewell Cushion Wheel Co.	Detroit
Sharrer Patent Top Co., Inc.	New York
Shaw Propeller Co.	Boston
Simplex Automobile Co., Inc.	New York
Skinner Co., Thos.	Quincy, Mass.
S-M-H Mfg. Co.	Pittsburgh
Spargo, J. S.	Boston
Spedolene Lubricant Co.	Malden
Speedwell Motor Car Co.	Dayton
Spitler, Bernard W.	Dorchester
Standard Oil Co. of New York	Boston
Standard Woven Fabric Co.	Framingham
Stanley Motor Car Co.	Newton
Stearns Co., F. B.	Cleveland
Sterling Motor Car Co.	Brockton
Stevens-Duryea Co.	Chicopee Falls

Stewart Accessories Co. Detroit
 Stewart Motor Corp. Detroit
 Stuart-Skinner Co. Worcester
 Studebaker Corp. Detroit
 Stutz Motor Car Co. Boston
 Stimpson, E. Y. Boston
 Taylor Corp., R. E. Boston
 Taylor Sales Co., J. M. Chicago
 Texas Co. Boston
 Tobey, Wm. L. East Boston
 Thomas Carbon Remover Co. Cortland, N. Y.
 Touraine Co. Philadelphia
 Triplex Inner Tube Co., Inc. Boston
 Tucker Co., J. C. Narragansett Pier, R. I.
 Trumbull Motor Car Co. Bridgeport

Turner, Harrison Boston
 Twombly Corp. Avondale, N. J.
 U-Kan-Plate Philadelphia
 Underhay Oil Co. Boston
 U. S. Mill Supply Co. Providence
 Universal Shock Eliminator, Inc. New York
 Vedoe Inflator Co. Boston
 Velie Motor Vehicle Co. Cambridge
 Victor Motor Car Co. Boston
 Vining, R. W. Boston
 Waite Co., Harold S. Brookline, Mass.
 Walker Lithograph & Pub. Co. Boston
 Waterbury, Louis S. Boston
 Waverley Co. Indianapolis

Webber Mfg. Co. Boston
 Wentworth-Brown Co. Boston
 Wentworth-Fosdick Co. Boston
 Westinghouse Air Spring Co. Boston
 Wheelock-Jeffrey Co. Boston
 White Co. Boston
 White & Bagley Co. Worcester
 Willys-Overland Co. Toledo
 Wilson Co., John V. Boston
 Wilson, J. R. Lincoln, Neb.
 Wing, Frank E. Boston
 Winton Motor Car Co. Boston
 Wonder-Mist Co. Boston
 Wollaston Foundry Co. Wollaston, Mass.
 X. Laboratories Boston

Elco Touring Car Will Sell for \$500

A five-passenger touring car, styled Elco 30, and selling for \$500 with single-unit electric lighting and starting equipment, will shortly be placed on the market by the Bimel Buggy Co., Sidney, O., of which A. C. Noble is president and T. M. Miller manager and treasurer. The power plant will be a Davis unit with block-cast L-head cylinders, 3 x 4, multiple disk clutch and three-speed gearset. Ignition will be by Atwater Kent system, lubrication by constant level splash, cooling by thermo-syphon and the carbureter a Zephyr. Regular equipment will include 30 x 3 tires; with 30 x 3½ straight-side tires and demountable rims the price will be \$50 extra. Wheels will be of wood, wheelbase 102 inches, tread 56 inches; lamps, electric horn, tool kit, jack and pump will be regular equipment.

Racine Show Also a Demonstration

The third annual motor exposition given by the dealers of Racine, Wis., in Lakeside Auditorium from February 18 to 20, embodied also a public demonstration of cars and trucks. Twenty-five different makes of cars and trucks, including the big three of Racine—Mitchell, Case and Lewis VI—were on exhibition for the three days. Just outside the auditorium two streets affording excellent grades to test pulling ability were used continually by dealers for the benefit of prospects and sub-agents. The streets were closed by order of the mayor during the show.

Larger Detroit Quarters for Hollier

The Detroit quarters of the Lewis Spring & Axle Co., at 1003 Woodward avenue, will either be enlarged and made more suitable for salesrooms or the headquarters will be located in another building. The company recently started to manufacture an eight-cylinder car, the Hollier, and the first demonstrators are to be sent to dealers early in March.

Dividends From Four Bankrupts

The creditors of four bankrupt concerns are receiving or will shortly receive dividends from the receiver, the Detroit Trust Co. The creditors of the Lozier Motor Co. are to receive a first dividend of 5 per cent, which will total about \$160,000; the first dividend to the creditors of the American Voiturette Co.

will be 10 per cent and total about \$50,000. A fourth dividend of 5 per cent has been ordered paid to creditors of the Flanders Mfg. Co., making the total to date 50 per cent, or about \$500,000. Application was also made to the court to pay a final dividend to the creditors of the Warren Motor Car Co., making a total of 20 per cent, or about \$80,000.

Burlington Dealers Plan Organization

Dealers in cars and accessories at Burlington, Vt., held a meeting last week and plans were made to form an organization. There were more than 30 present and a committee was chosen to make up a list of officers and draw up a set of by-laws for adoption later.

Hendricks Novelty, Hendricks Magneto

The Hendricks Novelty Co., Indianapolis, has changed its corporate name to Hendricks Magneto & Electric Co. The change in name is made to be in keeping with the nature of the company's principal products.

Denver Dealers Form Association

The Automobile Trades Association of Colorado has just been incorporated by the following six Denver dealers in motor cars and accessories: W. W. Barnett, R. C. Peete, Tom Botterill, R. R. Hall, J. D. Quinn and E. H. Bull. Among other things, the organization will establish and maintain a credit bureau.

The officers are: President, Charles T. Bruckman; first vice-president, John W. Foster; second vice-president, Henry P. Sebolt; treasurer, Tom Botterill; secretary, R. C. Peete. The organization will be controlled by a board of seven directors. Headquarters have been established in the Majestic building.

Packard Establishes Detroit Branch

The Packard Motor Car Co. will open a branch in Detroit March 1. The branch will be located temporarily at the main plant of the company, on East Grand boulevard. As soon as a suitable location is found in another part of the city a branch salesroom, garage and service station will be erected.

Boston Association Changes Name

The accessory dealers of Boston, who recently formed an organization, will change the name of Boston Automobile Trade Association.

Gasoline Prices Drop in Milwaukee

Further reductions in gasoline prices were announced in Milwaukee on February 25. It is believed that the exceedingly close competition among the filling stations is responsible for this reduction, which is the second since January 1. Comparative quotations for tank wagon delivery, which prices also govern retail sales at filling stations, are as follows:

Test	Feb. 25	Jan. 18	July 1, '14
60.....	10½ cents	11 cents	11½ cents
65.....	13 cents	13 cents	15 cents
70.....	15 cents	15 cents	17½ cents
72.....	16 cents	16 cents	19 cents

Garages are charging 2 cents over the above scale, but, mainly of their own accord, are doing little business except in emergency cases. Garagemen say they do not care to handle the fuel except for their own use, because of the inability to make any money out of it. Practically the only business they now get is from owners who store their cars and feel obliged to patronize the garage on such supplies and from drivers who are nearly dry and want enough gas to get to their usual supply stations.

Gas Goes Down in Chicago

The Standard Oil Co. of Indiana has reduced the price of gasoline and naphtha in Chicago ½ cent a gallon with a discount of 1 cent per gallon on 100-gallon lots to wholesalers, bringing gasoline down to a basis of 10½ cents and 9½ cents, and naphtha to 9½ and 8½ cents per gallon. Kerosene remains unchanged at 5½ cents.

Standard Gas Down ½ Cent in Detroit

A cut of ½ cent per gallon on gasoline went into effect last week at the Detroit gasoline filling stations controlled by the Standard Oil Co., the price now being 10½ cents. The independents have not yet met the reduction, though in several garages it is predicted that gas at less than 10 cents is only a question of a few weeks.

Smalley Daniels, manufacturers' distributor, Detroit, has completed arrangements whereby garagemen and repairmen can obtain the products of the New Era Spring & Specialty Co. at trade price without the necessity for purchasing them through the dealer of the car for which they are intended.

STUDEBAKER PROFITS TOP \$4,000,000 FOR THE YEAR

Annual Report Shows Increase of 150 Per Cent Over Profits for 1913—
Balance Sheet Shows Assets of \$56,500,000

The fourth annual report of the directors of the Studebaker Corp. and its subsidiary companies for the year ending December 31, 1914, shows net profits of \$4,441,966.16, as against \$1,772,473.65 net profits in 1913, which is an increase of \$2,669,492.51, or 150.6 per cent.

After the payment of the regular dividends on the preferred stock and transfer to special surplus account of the amount required to be set aside therein, the balance of the profits—\$3,165,893.11—was added to surplus and this account showed a total credit, as of December 31, 1914, of \$5,265,819.45 and the special surplus account showed a balance of \$1,230,747.54.

The net profits gave the company a return of 12.8 per cent on the outstanding common stock, after deducting the payment of 7 per cent preferred stock dividends, as against a return in 1913 of 3.1 per cent, but rather than use any part of the profits for the payment of dividends on the common stock, the directors believed it the wiser policy during the year to devote the profits to the payment of debts and to the increase of the cash balance, which resulted in a debt reduction of \$4,162,978.98 and an increase of \$1,581,703.05 in the cash on hand, making a total improvement in this respect of \$5,750,682.03 for the year.

The total net sales for the year were the largest in the history of the business, amounting to \$43,444,223.41, as compared with \$41,464,949.82 for 1913, an increase of 4.8 per cent.

Shipments in 1914 were 36,430 cars, compared with 32,504 in 1913. At the close of the year the company had made and sold over 150,000 Studebaker cars.

During the year the corporation purchased the remaining 6 per cent of the stock of the Studebaker Corp. of Canada, Ltd., Walkerville, Ont., and now owns this company entirely.

The report shows that the corporation's working capital on December 31, 1914, was \$14,771,150, an increase of \$2,892,132. Of the \$8,000,000 of 5 per cent gold notes sold in March, 1912, \$2,450,000 have been retired. Quick assets total \$24,665,019, against which stand liabilities of \$9,893,869.

The net expenditures for plant and property during 1914 were \$551,872.54 and the depreciation credits were \$361,794.01, so that only \$190,078.53 was added to this account.

The company has \$12,180,000 in preferred stock and \$27,931,600 in common stock. The active subsidiary companies of the corporation whose accounts are merged in the report are the Studebaker Corp. of America and the Studebaker Harness Co., of South Bend, Ind.; the Studebaker Corp. of Canada, Ltd., Walkerville; the Studebaker Bros. Co. Northwest, Portland, Ore.; and the Studebaker Bros. Co. of Utah, Salt Lake City, Utah.

Ball Bearings Still Coming In

The news that an embargo has been declared on ball bearings exported from Germany does not seem to have seriously bothered the big importing interests in this country if the notice sent

out by the Hess-Bright Mfg. Co., Philadelphia, can be taken as an index. In this they state that in spite of the reported obstacles to the importation of ball bearings they continue to receive shipments from the Berlin works. They also state that the total since September 15, 1914, has been 375,000 bearings of assorted sizes. A substantial increase in orders is claimed over the figures of last year in spite of the delays.

Motor Car Securities Quotations

	Feb. 27, 1914	Feb. 27, 1915
	Bid	Asked
Ajax-Grieb Rubber Co., com.....	200	250
Ajax-Grieb Rubber Co., pfd.....	89	102
Aluminum Castings Co., com.....	97	100
Chalmers Motor Co., com.....	94	90
Chalmers Motor Co., pfd.....	92	91
Firestone Tire & Rubber Co., com.....	285	280
Firestone Tire & Rubber Co., pfd.....	108 1/2	108 1/2
General Motors Co., com.....	68 1/2	68 1/2
General Motors Co., pfd.....	81	91 1/2
B. F. Goodrich Co., com.....	22 3/4	23 1/4
B. F. Goodrich Co., pfd.....	87 1/2	90
Goodyear Tire & Rubber Co., com.....	212	218
Goodyear Tire & Rubber Co., pfd.....	96	97 1/2
Gray & Davis Inc., pfd.....	90	97
International Motor Co., com.....	5	5
International Motor Co., pfd.....	15	15
Kelly-Springfield Tire Co., com.....	82	104
Kelly-Springfield Tire Co., 1st pfd.....	82	83
Kelly-Springfield Tire Co., 2nd pfd.....	122	127
Maxwell Motor Co., com.....	5 1/4	5 1/4
Maxwell Motor Co., 1st pfd.....	27 1/4	28
Maxwell Motor Co., 2nd pfd.....	9	9 1/2
Miller Rubber Co., com.....	158	160
Packard Motor Co., pfd.....	101	103
Packard Motor Co., com.....	98 1/2	95
Peerless Motor Car Co., com.....	30	21
Peerless Motor Car Co., pfd.....	80	55
Portage Rubber Co., com.....	40	34
Portage Rubber Co., pfd.....	80	85
Reo Motor Truck Co., com.....	12	12
Reo Motor Truck Co., pfd.....	18 1/2	25 1/4
Stewart-Warner Speed Corp., com.....	56	57 1/2
Stewart-Warner Speed Corp., pfd.....	88	100
Studebaker Corp., com.....	25 1/4	26 1/4
Studebaker Corp., pfd.....	81	83
Swinehart Tire & Rubber Co., com.....	69 1/2	70 1/2
U. S. Rubber Co., com.....	55 1/2	56 1/2
U. S. Rubber Co., pfd.....	101 1/2	100 1/2
White Co., pfd.....	107	110
Willis-Overland Co., com.....	67	68
Willis-Overland Co., pfd.....	94	98

STATISTICS OF THE GROWTH OF THE STUDEBAKER CORP.

	1914	1913	1912	1911
Profit from Mfgs.....	\$5,703,942	\$2,767,458	\$3,342,560	\$2,691,848
Other inc.....	133,965	83,465	122,392	113,089
Total inc.....	\$5,837,907	\$2,850,923	\$3,464,952	\$2,804,937
Sal. and dep.....	492,511	367,788	339,076	270,895
Balance.....	\$5,345,396	\$2,483,135	\$3,125,876	\$2,534,042
Charges.....	500,732	578,722	528,202	483,981
Surplus.....	\$4,844,664	\$1,904,413	\$2,597,674	\$2,050,061
Pfd. div.....	869,050	901,075	930,825	708,750
Balance.....	\$3,975,614	\$1,003,338	\$1,666,849	\$1,341,311
Extra exp. chgd. off.....	402,698	131,939	284,429	396,479
Surplus.....	\$3,572,916	\$871,399	\$1,382,420	\$944,832

* Equal to 14.23 per cent on \$27,931,600 common stock against 3.59 per cent on same stock previous year (after deducting full 7 per cent preferred dividend and before charging off \$402,697 for extraordinary expenses).

Net sales for the year were \$43,444,223, as compared with \$41,464,950 the previous year.

The consolidated balance sheet of the Studebaker Corp. as of December 31, 1914, compared as follows.

	1914	1913	1912	1911
Trade name, good will, patents, etc.....	\$19,807,277	\$19,807,277	\$19,807,277	\$19,807,277
Real estate, bldgs, mach. and equip.....	12,058,040	11,867,962	10,589,651	10,297,480
Foreign trade-marks.....	247,654	5,336	5,156	4,892
Inv. in other cos.....	246,509	1,075,692	1,199,640	1,199,640
Inventories.....	13,470,564	16,622,229	15,730,841	14,391,250
Accts. and notes receivable.....	6,698,148	5,923,793	4,958,121	5,668,661
Ins. unexpd., int. prepaid, etc.....	382,421	376,520	440,445	263,308
Disc't and com. on notes.....	327,068	412,859	506,632	381,829
Susp. acct.....	402,496	402,496	472,270	489,448
Cash.....	3,539,164	1,957,460	865,795	1,672,434
Total.....	\$56,530,336	\$57,622,440	\$54,451,881	\$54,176,222
Pfd. stock.....	\$12,180,000	\$12,650,000	\$13,095,000	\$13,268,479
Com. stock.....	27,931,600	27,931,600	27,931,600	27,931,600
Min. stkholders. int. in cap. stk. sub cos.....	28,300	54,341	28,300	28,300
5 per cent gold notes.....	5,550,000	6,800,000	7,600,000	10,050,000
Notes payable.....	1,850,000	4,550,000	1,400,000	313,312
Drafts disc.....	284,325	249,594	327,159	321,296
Dep. rec. on com. for sales of autos.....	1,853,160	2,098,134	1,182,944	1,044,623
Accts. pay.....	356,384	365,120	559,625	268,777
Sundry res.....	1,230,748	823,724	*417,009	944,832
Spec. surp. account.....	5,265,819	2,099,926	1,910,243	944,832
Surplus.....	\$56,530,336	\$57,622,440	\$54,451,881	\$54,451,222

* Applied to purchase of preferred stock for cancellation under provision of charter.

WILL MARKET NEW LOZIER BETWEEN \$1,800-\$2,000

Big Six and Four Also to Be Continued, All Building Being Done in Detroit—Organization Changes

Within the next two weeks the new owners of the Lozier Motor Co. will place on the market a new Lozier car which will have all the features and characteristics of the former Lozier models. The price will be between \$1,800 and \$2,000. The big six and the four are also to be continued. At the present time about 175 men are employed and this force will be increased. W. G. Thomas, formerly with the Pierce-Arrow, E. R. Thomas and Packard companies, has been appointed production manager.

H. H. Williams, who has been identified with the Lozier organization for many years, is in charge of the service and sales department. Many of the former Lozier dealers will continue to handle the Lozier cars. There will be no resumption of operation at the former Lozier plant in Plattsburg, N. Y. This property will be sold. All production and service activities are concentrated in the Detroit plant.

PROMINENT MEN OF TRADE WHO ASSUME NEW DUTIES

**Resignations and Promotions That Serve
to Place Many Workers in New
Places—Few of Them Leave
the Industry**

E. N. Mackey, Hartford, Conn., has just been appointed dealer for Dayton airless and Dayton pneumatic tires.

F. E. McCleary has been placed in charge of the recently enlarged metallurgical department of Dodge Bros., Detroit.

W. E. Trenchard, Columbia, S. C., has been appointed dealer for Dayton airless and Dayton pneumatic tires for the State of South Carolina.

Frederick P. Bentley, formerly connected with the Boston branch of the White Co., has joined the sales force of the Fiat Motor Car Co., Boston.

G. A. Mevis has been appointed manager of the Springfield Buick Co., Springfield, Mass. The company will move to 650 Main street early this month.

C. R. Green has resigned as chief engineer of the Speedwell Motor Car Co., Dayton, and has accepted a position in a similar capacity with the Mead Engine Co., Dayton.

R. Stanley Smith, chief engineer of the A. O. Smith Co., Milwaukee, has resigned his position to take up work as consulting engineer, with offices in Detroit after May 1.

J. L. Kier has been appointed manufacturers' agent for the Troy Wagon Works Co., Troy, O. His offices are in the Abbott building, Broad and Race streets, Philadelphia.

Edward F. Lyon will be in charge of the salesroom of the Lewis Spring & Axle Co., at 1003 Woodward avenue, Detroit, where the Hollier eight-cylinder car will be handled.

Albert R. Hazen, formerly with the Oldsmobile branch in Boston and later with the International Harvester Co., has joined the Reed-Crockett Co., selling Detroiters in New England.

B. A. Simpson, during the past six years with the Omaha (Neb.) Buick agency, has been appointed manager of the retail business of the Apperson Jack Rabbit Automobile Co., 2417 Farnam street.

Ray Hockaday, of Wichita, Kan., will be the manager of the Hutchinson (Kan.) branch of the Hockaday Automobile Supply Co., which opened March 1. The firm is occupying the building at 27 Sherman east.

Frank S. Sims, who was assistant advertising manager of the Timken-Detroit Axle Co., Detroit, has been ap-

pointed advertising manager. E. A. Walton, who held that position, resigned some time ago.

C. R. Dunwoody, who was formerly connected with one of the large rubber companies, is now handling the Dayton airless and Dayton pneumatic tires in the states of Georgia and Florida. His headquarters are in Jacksonville.

Eugene L. Caton, for some time with the Hudson agency in Worcester, has joined the sales force of the Norcross Automobile Co., Worcester, Buick dealer. He is president of the Worcester Automobile Dealers' Association.

Jay A. Mellish, for several years manager of the Exchange Car Department of the Locomobile Co. of America, has resigned and joined the sales force of the Harrolds Motor Car Co., New York distributor of Pierce-Arrow cars.

J. M. Quinn is the new manager of the Pittsburgh (Pa.) branch of the Goodyear Tire & Rubber Co., 5952 Baum boulevard. He succeeds W. A. Hazlett, who was recently promoted to the position of manager of the Goodyear branch in Detroit.

G. S. Loomis and **W. F. Winklemann**, formerly connected with the Packard Motor Car Co., Detroit, have been appointed general manager and sales manager, respectively, of the Southern Motors Co., agent for Packard, Hudson, Dodge and Detroit electrics, Louisville, Ky.

A. Warren Cahill, for many years joint agent for the Wells-Fargo and Western express companies at Waukesha, Wis., has resigned to become a member of the Jesse A. Smith Auto Co., Milwaukee, representing the Hudson in Wisconsin and northern Michigan. He will become head of the traveling and sales force.

E. P. Kempff, formerly with the Front-Market Motor Supply Co., is in charge of a factory branch which the Fisk Rubber Co. established March 1 in Harrisburg, Pa. C. D. Whitney, district representative for Fisk tires in this territory, will be associated with the branch and make the Harrisburg store his headquarters.

J. C. Morris, formerly manager of the Johns-Manville Co., Seattle, Wash., for the entire Northwest, this week signed a contract with the Moon Motor Car Co., St. Louis, to handle the company's automobiles in the Northwest. He assumes entire charge of that district, selecting agents in Washington, Oregon, Idaho, Montana and Colorado.

Geuder, Paeschke & Frey Co., Milwaukee, has opened an office at 1308 Majestic building, Detroit. A. B. Walker, as direct factory representative, is in charge. The company specializes in sheet metal stampings, including oil pans, axle housings, gasoline tanks and mufflers.

NEW GASOLINE PROCESS TO INCREASE YIELD 200%

**Government Chemist Perfects Simple,
Safe Method and Will Make It
Public—Standard Oil Depre-
cates Its Value**

WASHINGTON, D. C., Feb. 28—Two important chemical processes affecting the motor car industry have been discovered by Dr. Walter E. Rittman, chemical engineer of the United States Bureau of Mines. One is a new method of producing gasoline and the other of manufacturing toluol and benzol, the latter of which can also be used as a motor fuel.

Dr. Rittman plans to dedicate his patent to the whole American people so that both small and large refiners can avail themselves of a cheap process for making crude oil into gasoline. Heretofore large corporations have had an advantage because they have had the most money, could employ the best chemists and evolve the best processes for obtaining gasoline from the crude oil.

The first Rittman process may enable the independent refiners to increase their output of gasoline from petroleum 200 per cent or more. With an estimated production by the independent refiners of 12,000,000 barrels yearly, this will mean an output of 36,000,000 from the independents alone.

The second process enables benzol and toluol to be made from crude petroleum, two products which heretofore could be obtained only from coal tar residues. Benzol is also a good fuel and is used extensively in Europe; however, it is planned to use these two substances for the production of explosives and dye-stuffs.

Standard Is Not Alarmed

NEW YORK, Mar. 2—A Standard Oil official stated that this company has not taken the announcement of the new fuel seriously, although it is admitted that nothing is known of Dr. Rittman's discoveries. The company took the attitude that if the patents were given to the public it would be able to use them as well as anyone else.

The Standard Oil company also pointed out that benzol and toluol can be produced from very few crude oils, and that millions of pounds of coal tar products are yearly burned under coke ovens, and that these products could be utilized in producing benzol and toluol if it were not cheaper to buy them from Germany. No allowance, however, was made for the fact that Dr. Rittman's new method might make the cost of manufacture so low that it would be cheaper to make these products than to import them from Europe.

BAKER PATENT HELD VOID AND INJUNCTION REFUSED

Finch, Chalmers Dealer, Given Favorable Decision in Suit Brought by American Ball Bearing Co.—No Injunction, Says Court

CLEVELAND, O., Mar. 2—In an opinion just rendered, Judge John H. Clarke, in U. S. District court, upheld the prior art claims of the defense in action of The American Ball Bearing Co. against Edward B. Finch, former Cleveland representative of the Chalmers Motor Co. He refused to grant an injunction or damages for what the complaint alleged as infringement of a patent issued to Walter C. Baker, of the Baker Electric Vehicle Co. and The American Ball Bearing Co.

Judge Clarke reviewed the evidence at length, with the statement that: "The only question I shall consider is: 'Is the combination of the patent such as have required inventive genius to develop it in a mind informed in the art to which it relates at the time the patent was applied for in February, 1902?'"

"The desirability and importance of bringing the steering knuckle as closely as practical to the hub and to the plane of the tread were perfectly understood prior to 1902. Such appears in the testimony of Professor Carpenter, expert witness for the plaintiff, and in that of Mr. Baker, and is clearly shown by the Faure patent, 591,595, in 1897; by the Clubbe and Southey patent, 621,017 in 1898, and by the Knudsen reissued patent, 11,721. Thus it is clear that the locating of the steering knuckle was actually practiced prior to 1902.

"The Robinson patent, 599,866, in 1898, has for its object the improving and simplifying of the construction of ball bearings for vehicles and the drawings of this patent clearly show the anti-friction balls near the outer and inner ends of the spindle, the larger ones being nearer the inner end.

"Professor Carpenter said: 'It would be idle for me to take the stand that Mr. Baker was the first to employ anti-friction bearings in the spindle of a steering axle, nor does the Baker patent assert that he was the first to do so.'

"He said it was the general practice prior to 1902 where a load shaft was supported by bearings at the two ends, to vary the sizes of these bearings according to the location of the load along the length of the shaft.

"Artillery wheels, too, the evidence shows, were in general use before even the advent of the automobile.

"It seems clear that not only were all of the features of the claimant combination familiar to persons skilled in the art of 1902 or even in 1898 but that the arrangement as provided in the Baker patent and the reason for such adjustment would seem to have been obvious.

"It seems clear that the various elements of the Baker patent are not so grouped as to produce any new or useful result. The knuckle close to the plane of the wheel produces the same effect in the Baker construction that it did in the Panhard of 1902, a model of which was offered in evidence. At best it is a slight carrying forward of ideas which the state of prior art shows were common among men skilled in it.

"This conclusion involving as it does the finding that the patent suit is void for want of patentable novelty and invention makes unnecessary

the consideration of the many other questions stated upon the record in this case."

Keeton Plans to Continue

The Keeton Motor Car Co., Detroit, has purchased the Keeton business from S. L. Winternitz. It is the intention of the company to reorganize and not only to continue to furnish all repairs for Keeton cars, but to continue their manufacture in a small way. According to announcement from that company, it is able to furnish repairs promptly.

Walpole Reorganization Plans Complete

The stockholders' committee of the Walpole Tire & Rubber Co., Boston, has joined with the reorganization committee, of which J. H. MacAlman is chairman, and hereafter these two committees will act jointly in the interests of stockholders. The proposed plan of reorganization as outlined by the joint committee in a letter just issued is for a company with \$500,000 first mortgage, 6 per cent, 10-year bonds, \$1,500,000 non-cumulative 7 per cent preferred stock of a par value of \$100, and \$1,000,000 common stock with a par value of \$50.

Engineers to Visit Georgian Bay

The forthcoming annual Summer Session of the Society of Automobile Engineers will be held aboard the steamship Noronic, of the Northern Navigation Co., leaving Detroit June 14 and returning June 17. The destination is Georgian Bay.

Will Build Weidely Motors

The Weidely Motor Co., Indianapolis, has been incorporated and taken a factory building at 133-43 South West street to manufacture the Weidely motor. The officers are: President, W. E. Showers, Bloomington, Ind.; vice-president and general manager, George A. Weidely; treasurer, W. A. Umphrey; secretary, L. A. Poundstone; directors, Edmond Rosenberg, George Hughes.

Detroit Branch for Carr

The F. S. Carr Co., Boston, manufacturer of Neverleek top materials, will open a branch at 971 Woodward avenue, Detroit.

DELION TIRE & RUBBER OPENS UP IN TRENTON

Will Make Only Pneumatics—400 Tires and 600 Tubes a Day—Is Eighth Rubber Plant to Locate in Trenton

The formal opening of the plant of the Delion Tire & Rubber Co., Trenton, N. J., took place February 26, with speeches by Senator Leavett of Mercer county and Major L. N. Clayton. The Delion is the eighth rubber tire plant to locate in Trenton, making that city next to Akron in the matter of numbers and importance in the tire industry. The plant is of the latest construction throughout, consisting of brick and concrete, the size of the factory being 238 x 75 feet, with two floors. The latest tire making machinery and labor saving devices are used. The company will produce about 400 tires and 600 tubes a day when working on full time and will employ 300 men. No hard rubber tires will be manufactured. Delion tires will carry a guaranteed mileage of 4,000 miles. Active manufacturing will start March 1. The officers and directors of the company are: President, H. H. Coleman, Newark; vice-president, F. J. Wetzel, Trenton; secretary and assistant treasurer, G. H. Graham, Jr. Directors, Charles R. Whitehead, Morristown; L. B. Tompkins, Morristown; Manuel Llara, F. G. Hasselman and W. T. Rock, New York; Warren A. Clapp, East Orange, and Lionel Emdin, New York. Emdin will also be general sales manager, with headquarters in a new store located at 1791 Broadway, New York.

Lowell Dealers Break Bread

The annual banquet of the Lowell Automobile Dealers Association was held at the Richardson hotel last week. Addresses were made by President M. D. Brown, Treasurer T. L. Williston, Secretary M. F. Feindell and Joseph Maren, P. N. Cossette, D. A. McKenzie, Stephen Rochette, Harry Pitts, Milo Hale and A. G. Beharrell.



The plant of the Delion Tire & Rubber Co. is two stories, brick and concrete, 238 x 75 feet. The product will carry a 4,000-mile guarantee

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Carter, "Nwcm" Newcomb, "N.E." North East, "A-C" Allis-Chalmers, "L-N" Leeco-Neville, "O.M." Owen Magnetic, "B-Rshmr" Bosch-Rushmore, "Frn Trs" Friction Transmission, "Mgnto" Magneto.

NOTE—The figures given in columns underneath 2-, 5- and 7-passenger, represent the list catalog prices of the models. Where a tire size is given, as for instance "37x5½" it means that the rear tires are 37x5½ and the front are of smaller dimension.

NOTE—The figures given in columns underneath 2-, 5- and 7-passenger, represent the list catalog prices of the models. Where a tire size is given, as for instance "37x5½" it means that the rear tires are 37x5½, and the front are of smaller dimension.

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT											
O	4-3½x4	Disco	Johns	Disco	Disk	3	108	32x3½	850	850	....
M	4-3½x4	Bosch	Stmng	N E	Disk	3	108	32x3½	995	995	....
LAMBERT											
48-C	4-3½x4	Brggs	Shblr	Brggs	....	112	32x3½	....	1,200	....	....
68-C	4-4½x5½	Brggs	Shblr	Brggs	....	117	34x3½	....	1,565	1,565	....
LENOX											
Four	4-4½x5½	Wths	Own	Wths	Cone	3	118	34x4½	....	2,000	....
81x	6-3½x5½	Wths	Own	Wths	Cone	3	130	34x4½	....	2,465	....
LEWIS											
...	6-3½x6	Brggs	Stmng	Remy	Disk	3	125	36x4	1,600	1,600	....
LEXINGTON											
Four	4-3½x5½	Wths	Shblr	Wths	Disk	3	115	34x4	1,375	1,375	....
6-L	6-3½x5	Wths	Shblr	Wths	Disk	3	128	34x4	1,875	1,875	....
6-M	6-4½x5	A. Kent	Stmng	Jesco	Cone	3	130	36x4½	2,575	2,575	2,675
LOCOMOBILE											
M-5	6-4½x5½	Bosch	Own	Wths	Disk	4	140	37x5	5,100	....	5,100
R-5	6-4½x5	Bosch	Own	Wths	Disk	4	132	37x5½	4,400	4,400	....
LUVERNE											
700	6-4 x5	Bosch	Shblr	Jesco	Disk	3	128	36x4½	....	....	2,500
LYONS-KNIGHT											
K-4	4-4½x5½	Simms	Stmng	N E	Disk	3	120	37x5	....	2,900	2,980
MARION											
...	8-3½x4½	Bosch	....	G & D	Disk	3	115	34x4	1,500	1,500	....
...	6-3 x5	Bosch	....	G & D	Disk	3	122	34x4	....	1,350	....
...	4-3½x5	Bosch	....	G & D	Disk	3	115	34x4	....	1,250	....
MARMON											
41	6-4½x5½	Bosch	Stmng	Bosch	Cone	3	132½	36x4½	2,250	2,250	3,350
48	6-4½x6	Bosch	Zenith	Roth	Disk	3	145	37x5½	....	....	5,000
MAXWELL											
25	4-3½x4½	Simms	Kingstn	Simms	Cone	3	103	30x3½	735	750	....
McFARLAN											
T	6-4 x6	Wths	Stmng	Wths	Cone	3	122	36x4½	1,500	2,500	2,500
X	6-4½x6	Wths	Stmng	Wths	Cone	3	122	36x4½	2,900	2,900	2,900
McINTYRE											
25	4-3½x5½	Bosch	Stmng	G & D	Cone	3	106	28x3½	....	850	....
6-40	6-3½x4½	Brggs	Stmng	Brggs	Disk	3	120	35x4	....	1,375	....
MERCER											
Spdstr	4-3½x6½	Bosch	Zenith	U.S.L.	Disk	4	130	34x4½	2,750	....	....
Bdstr	4-3½x6½	Bosch	Zenith	U.S.L.	Disk	4	130	34x4½	....	3,000	....
METEOR											
42	4-4 x5	A. Kent	Stmng	Spdfr	Disk	3	114	34x4	....	1,075	....
45	6-3½x5	A. Kent	Stmng	Spdfr	Disk	3	126	35x4	....	1,385	....
METZ											
22	4-3½x4	Bosch	Own	G & D	....	96	30x3	495	....	....	....
25	4-3½x4	....	A.W.T.	G & D	....	105	32x3½	....	900	....	....
MITCHELL											
Four	4-4 x5½	Conn	....	Spdfr	Cone	3	116	34x4	1,250	1,250	....
81x	6-4 x5½	Conn	....	Spdfr	Cone	3	129	36x4	1,585	1,585	....
7-6	6-4½x7	Remy	....	Remy	Cone	3	144	37x5	....	2,350	....
6-6	6-4½x6	Remy	....	Remy	Cone	3	132	36x4½	1,395	1,895	....
MOLINE-KNIGHT											
...	4-4 x6	Bosch	Shblr	Wgner	Cone	4	128	36x4½	2,500	2,500	2,500
40	4-3½x5	Conn	....	....	Cone	3	118	34x4	....	1,475	....
MONARCH											
81x	6-3½x5	A. Kent	Zenith	W. Lord	Cone	3	125	33x4	....	1,250	1,275
MONROE											
M-2	4-3 x3½	Conn	Zenith	A-Lite	Cone	3	96	30x3	460	....	....
MOON											
4-28	4-3½x5	Delco	Rafid	Delco	Disk	3	123	34x4	1,350	1,350	....
6-40	6-3½x5	Delco	Rafid	Delco	Disk	3	123	34x4	1,575	....	....
6-50	6-3½x5½	Delco	Rafid	Delco	Disk	4	130	35x4½	2,150	....	....
MORSE											
D	4-4½x5	Eismn	Stmng	G & D	Disk	4	127	36x4½	3,000	3,000	3,000
NATIONAL											
AB	6-3½x5½	Eismn	Rafid	Wths	Cone	3	134	36x4½	2,375	2,375	....
NORWALK											
F	6-3½x5½	A. Kent	Rafid	G & D	Disk	4	131	37x4	1,675	....	....
OAKLAND											
37	4-3½x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,150	1,200	....
40	6-3½x5	Delco	Johns	Delco	Cone	3	123½	35x4½	....	1,685	....
Spdstr	4-3½x5	Delco	Marvel	Delco	Cone	3	112	33x4	1,100	....	....
OGREN											
81x	6-3½x5½	Bosch	Rafid	B-Rahmr	....	3	....	....	....	2,500	....
OLDSMOBILE											
42	4-3½x5	Delco	Marvel	Delco	Cone	3	113	33x4	1,285	1,285	....
55	6-4½x5½	Delco	Marvel	Delco	Cone	3	130	36x5	....	2,975	....
OVERLAND											
80	4-4½x4½	Bosch	Shblr	A-Lite	Cone	3	114	34x4	1,050	1,075	....
81	4-4 x4½	Spdfr	Shblr	A-Lite	Cone	3	106	33x4	795	850	....
82	6-3½x5½	Bosch	Shblr	A-Lite	Cone	3	125	35x4½	....	1,475	....
OWEN											
...	6-3½x5½	Owen	Master	O.M.	O.M.	136	35x5	3,750	....	3,750	....
PACKARD											
3-38	6-4 x5½	Bosch	Own	Bljur	Plate	3	140	37x5½	3,750	3,750	3,850
5-48	6-4½x5½	Bosch	Own	Bljur	Plate	3	144	37x5	4,750	4,750	4,850
PAIGE											
81x	6-3½x5½	Bosch	Rafid	G & D	Disk	3	124	34x4	1,395	....	1,395
36	4-4 x5	Bosch	Stwrt	G & D	Disk	3	116	34x4	1,075	1,075	....
PARTIN-PALMER											
20	4-3½x4	A. Kent	Muir	G & D	Disk	3	96	28x3	495	....	....
38	4-3½x5½	A. Kent	Stmng	G & D	Cone	3	115	33x4	....	....	....
PATERSON											
4-32	4-3½x5	Delco	Stmng	Delco	Cone	3	112	33x4	....	1,095	....
6-48	6-3½x5	Delco	Stmng	Delco	Cone	3	124	34x4	....	1,495	....
PATHFINDER											
...	6-3½x5½	Wths	Shblr	Wths	Disk	4	125	34x4½	2,322	....	2,322

Model	Motor	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PEERLESS											
54	4-3½x5	A. Kent	Stmng	G & D	Disk	3	113	34x4	2,800	2,900	....
55	6-3½x5	A. Kent	Stmng	G & D	Disk	3	121	34x4	2,250	2,250	....
48-6	6-4½x6	Bosch	Own	G & D	Band	4	137	37x5	4,900	....	5,900
PETER PAN											
3-E	4-2½x4½	Brng	.....	.....	Diak	3	110	29x3½	650	....	....
PIERCE-ARROW											
C-3	6-4 x5½	Bosch	Own	Wths	Cone	4	134	36x4½	4,300	4,300	....
B-3	6-4½x5½	Bosch	Own	Wths	Cone	4	142	37x5	4,900	4,900	5,900
A-3	6-5 x7	Bosch	Own	Wths	Cone	4	147½	38½x5½	5,900	5,900	6,900
PILOT											
55	6-3½x5½	Wths	Shblr	Wths	Cone	3	126	34x4	1,835	1,835	1,985
75	6-4½x6	Wths	Ctr	Wths	Cone	3	132	37x4½	2,885	2,885	2,885
PREMIER											
6-50	6-4 x5½	Eismn	Rafid	Remy	Disk	3	132	36x4½	1,985	1,985	1,985
PRATT											
6-50	6-3½x5½	A. Kent	Rafid	G & D	Disk	4	132	37x4½	2,150	2,150	2,250
PULLMAN											
Jr	4-3½x4½	Spldf	Stmng	Spldf	Disk	3	110	30x3½	740	740	....
6-48	6-3½x5½	Simms	Stmng	Wths	Disk	4	124	36x4½	2,500	2,500	2,500
RAYFIELD											
20	4-2½x4½	.....	Own	.....	Disk	3	96	28x3	....	395	....
R-C-H											
K	4-3½x5	Bosch	B-D	W. Lord	Cone	3	110	32x3½	....	775	....
REGAL											
D	4-3½x5	A. Kent	Stwrt	Bosch	Cone	3	112	33x4	1,085	1,085	....
...	8-2½x4½	.....	Stwrt	B. Rahmr	....	112	33x4	1,250	1,250	....	....
...	4-3½x3½	.....	.....	Spldf	....	3	106	30x3½	650	650	....
REMINGTON											
...	4-3½x4	A. Kent	.....	W. Lord	Cone	3	100	30x3½	695	695	....
Gho	8-3½x4½	A. Kent	Zenith	G & D	Disk	3	116	35x4½	1,495	....	....
REPUBLIC											
E	6-4½x5	Delco	Rafid	Delco	Cone	4	132	36x4½	....	2,950	2,950
REO											
M	6-3 9-16x5½	Remy	Johns	Remy	Disk	3	122	34x4	....	1,385	....
8T	4-4½x4½	Natnl	Holley	Natnl	Disk	3	112	34x4	1,000	....	....
R	4-4½x4½	Remy	Holley	Remy	Disk	3	115	34x4	....	1,050	....
ROSS											
...	8-3 x4½	.....	.....	Own	Disk	3	115	34x4	....	1,350	....
SAXON											
A	4-2½x4	A. Kent	Mayer	.....	Plate	2	96	28x3	495	....	....
B2	6-2½x4½	A. Kent	.....	G & D	Disk	3	112	32x3½	....	785	....
SCRIPPS-BOOTH											
C	4-3½x4	A. Kent	Zenith	Bljr	Cone	3	110	36x3½	775	....	....
SPAULDING											
H	4-4½x5½	Simms	Rafid	Ents	Cone	3	120	36x4	....	1,690	....
S. G. V.											
J	4-3½x4½	Bosch	Zenith	W. Lord	Disk	4	118	34x4	2,300	2,300	....
SIMPLEX											
38	4-4½x6½	Bosch	Nwcmh	Bosch	Disk	4	137	37x5½	All bodies	to order	
50	4-5½x6½	Bosch	Nwcmh	Bosch	Disk	4	137	37x5½	All bodies	to order	
SINGER											
Slx	6-4 x5½	Eismn	C R G	Wths	Disk	4	135	36x4½	2,350	2,350	....
SPEEDWELL											
I	6-4½x5½	Wths	Shblr	Wths	Disk	3	125	37x5	....	....	2,900
SPHINX											
A-15	4-3½x5	Spldf	Mayer	Spldf	Cone	3	112	36x3½	....	695	....
STEARNS											
L-4	4-3½x5½	Bosch	Shblr	G & D	Cone	3	119	34x4	1,750	1,750	....
S-K-4	4-4½x5½	Bosch	Stmng	G & D	Disk	3	127	36x4½	3,750	3,750	3,900
S-K-6	6-4½x6½	Bosch	Stmng	G & D	Disk	4	134	37x5	4,950	4,950	5,000
STUDERAKER											
4-SD	4-3½x5	Remy	Shblr	Wagner	Cone	3	106	33x4	985	985	....
6-E.C.	6-3½x5	Remy	Shblr	Wagner	Cone	3	121	34x4	....	1,385	1,450
STUTZ											
H.C.8	4-3½x5	Remy	Stmng	Remy	Cone	3	108	32x4	1,475	....	....
Br. Cat	4-4½x5½	Bosch	Stmng	Remy	Cone	3	120	34x4½	2,000	....	....
Slx	6-4 x5	Eismn	Stmng	Remy	Cone	3	130	34x4½	2,125	....	....
T. Car	4-4½x5½	Bosch	Stmng	Remy	Cone	3	130	34x4½	....	2,275	....
T. Car	6-4 x5	Eismn	Stmng	Remy	Cone	3	130	34x4½	....	2,400	....
TOURAINE											
12	6-4 x5½	Simms	Zenith	Wths	Disk	4	124	34x4½	2,150	2,150	2,250
TRUMBULL											
15-AB	4-3½x4	Spldf	Brse	W. Lord	Cone	3	80	28x3	395	....	....
TWOMBLY											
...	4-3½x4	Spldf	Zephyr	Undec	Cone	3	100	36x3	690	750	....
VELIE											
4-45	4-4½x5½	Bosch	Stmng	G & D	Disk	4	121	37x4½	1,750	1,750	....
6-50	6-3½x5½	Bosch	Stmng	G & D	Disk	4	130	37x4½	2,075	2,075	....
Blwtl	6-3½x5	A. Kent	Stmng	G & D	Disk	4	134	34x4	1,595	1,595	....
VIXEN											
S.B	4-2½x4	A. Kent	Zephyr	.....	....	106	28x3	395	....	....	....
VULCAN											
...	4-3½x5½	Wths	.....	Wths	Disk	3	120	32x3½	975	975	....
WESTCOTT											
O	4-3½x5	Delco	.....	Delco	Cone	3	112	33x4	1,185	1,185	....
U	6-3½x5	Delco	.....	Delco	Cone	3	125	34x4	....	1,895	....
WHITE											
30	4-3½x5½	Bosch	Own	Own	Plate	4	115	32x4	2,650	2,700	....
45	4-4½x6½	Bosch	Own	Own	Plate	4	122½	36x4½	....	....	2,900
80	6-4½x5½	Bosch	Own	Own	Plate	4	140½	37x5	All bodies	to order	
WILLIS-KNIGHT											
K-19	4-4 x5½	Simms	Zenith	U.S.L	Cone	4	120	36x4½	....	2,475	....
WINTON											
21	6-4½x5½	Bosch	Rafid	Alr or Elec	Disk	4	126	37x5	2,350	2,350	2,900
21A	6-3½x5½	Bosch	Rafid	Alr or Elec	Disk	4	128	36x4½	2,285	2,285	....
WOODS MOBILETTE											
3	4-2½x4	Manto	.....	.....	Cone	2	104	28x2½	390	....	....

Motor Car Agencies Recently Established

PASSENGER CARS

NEW YORK

Place	Car	Dealer
Millerton	Case	Millerton Garage
Mineola	Case	T. F. Roche
Monsey	Saxon	C. A. Johnson
New Glarus	Case	Hooley & Hooley
New Rochelle	Saxon	Tracy Rochfeld
New York	Lewis	Stewart Auto Co.
New York	Lexington	Lexington Sales Co.
Oyster Bay	Case	Sagamore Garage Co.
Park Falls	Case	J. B. Saunders
Quogue	Case	C. W. Beery
Rhinebeck	Saxon	Turton & Snyder
Richland	Case	W. O. Paddock
Rochester	Lexington	Pritchard-Lyon Motors Corp.
Schenectady	Imperial	Wideman-Niles Garage
Seneca Falls	Kissel	O. E. & E. J. Biegel
Silver Creek	Detroit	F. B. Porter
Southold	Case	Southold Garage
Sterens Point	Case	Reliable Garage
Syracuse	Saxon	Shaw & Sissons
Utica	Detroit	Henry & Morris
Watertown	Detroit	Iroquois Garage

NORTH CAROLINA

Charlotte	King	A. Burwell
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OHIO

Akron	Davis	L. P. Putt
Camden	Davis	J. E. Sizelove
Cincinnati	Davis	Bente & Rieke
Cincinnati	Lewis	Kenton Motors Co.
Cincinnati	Lexington	Cincinnati Mot. Truck Co.
Cleveland	Jeffery	J. H. Greenwald Co.
Cleveland	Chandler	Cuyahoga Sales Co.
Cleveland	Cole	Richardson Motor Car Co.
Cleveland	Paige-Detroit	Lucas & Christenson
Cleveland	Velle	Velle Motor Car Co.
Cleveland	Maxwell	Velle Motor Car Co.
Cleveland	Krit	Forest City Garage
Cleveland	King	Dunham Motor Car Co.
Cleveland	Moon	Dunham Motor Car Co.
Cleveland	Franklin	Eckert Sales Co.
Cleveland	Haynes	Cleveland Motor Car Co.
Cleveland	Hudson	Hudson Stuyvesant Co.
Cleveland	Apperson	Elsman Automobile Co.
Cleveland	Imperial	Elsman Automobile Co.
Cleveland	Lewis	Elsman Automobile Co.
Cleveland	Dodge	Neighbors Motor Co.
Cleveland	Reo	Auto Sales Co.
Cleveland	Saxon	Euclid Squa. Supply Co.
Cleveland	Ohio	H. D. Haupt
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Cleveland	Empire	Empire-Briscoe Co.
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Place	Car	Dealer
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York	Dodge	J. W. Richely Auto Co.

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TENNESSEE

Memphis	Ohio	H. A. White Auto Co.
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TEXAS

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Galveston	Saxon	C. Newding
San Antonio	Lewis	Lawton Motors Co.

UTAH

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Salt Lake City	Chandler	C. A. Quigley

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No. Emporia	Case	R. T. Taylor
Richmond	Imperial	Alsop Motor Car Co.

WASHINGTON

Walla Walla	King	Moore Auto & S. Co.
Spokane	King	Moylan & Reilly Auto Co.

VERMONT

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Clarksburg	Lewis	Home Furnishing Co.
Clarksburg	Lexington	J. M. Shields
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Chippewa Falls	Dodge Bros.	M. Cameron
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Clinton	Dodge Bros.	Terwilliger & Son
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Place	Car	Dealer
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Delavan	Overland	C. H. Burns
Delavan	Ford	C. H. Burns
Delavan	Ford	C. J. Quinn
Eau Claire	Haynes	Johnson Mch. Works
Eau Claire	Oldsmobile	Darwin Motor Car Co.
Gillett	Bulck	C. F. Kitzinger
Hancock	Overland	Jones & Pierce
Hillsboro	Oldsmobile	Picha Brothers
Iola	Overland	Swenson & Rosholt Garage
Iola	Ford	Swenson & Rosholt Garage
Iola	Case	Swenson & Rosholt Garage
La Crosse	Paige	J. Nietsz
Lake Mills	Studebaker	F. M. Seaver
Madison	Dodge	Madison Motor Car Co.
Madison	Overland	Park Motor Co.
Madison	Cole	Park Motor Co.
Markesan	Kissel	W. H. Wilson
Marshfield	Kissel	Hugo Wagner
Marshfield	Grant	Hugo Wagner
Millwaukee	Marmon	Hughes Motor Car Co.
Millwaukee	Velle	Walt Auto Co.
Millwaukee	Moline	Walt Auto Co.
Millwaukee	Detroit	Waukegan Motor Sales Co.
Millwaukee	Moon	Durbin-Thomson Co., Ltd.
Millwaukee	Abbott	Intersection Garage Co.
Millwaukee	Chevrolet	Wells Garage Co.
Millwaukee	Lewis	Waukegan Motor Sales Co.
Millwaukee	Monroe	Wells Garage Co.
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Pella	Haynes	F. A. Crosskroph
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Rhineland	Parlin-Palmer	Roland Scheibe
Sheboygan	Cole	H. Strussling Garage
Sheboygan	Ford	Gillette Motor Co.
Sheboygan	Sphinx	H. Strussling Garage
Sparta	Kissel	George Mammel
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Westby	Oldsmobile	A. Cutts
Whitehall	Oldsmobile	Hanson & Nustad
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Rock River	Oldsmobile	J. C. Schorch
Rock Springs	Oldsmobile	West Central Auto Co.



* Indicates sanctioned by A. A. A.

Mar. 6, San Francisco, Cal.—Vanderbilt Cup Race, Panama-Pacific Exposition Grounds. Promoter, Panama-Pacific Exposition Co.*

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.*

Mar. 20, Tucson, Ariz.—Road race, Borderland Automobile Club.

Mar. 23-28, Phoenix, Ariz.—Automobile-Architectural-Industrial Exposition; Armory.

April 20-22, Oklahoma City, Okla.—Road race, S. W. Auto Racing Assn.*

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.*

June 9, Galesburg, Ill.—Galesburg District Fair Association's 200-mile race.

June 19, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Assn.*

June 25, Sioux City, Ia.—Track meet.

July 3, Sioux City, Ia.—Speedway, 300-mile race, Speedway Assn.*

July 4, Tacoma, Wash.—Speedway races, Speedway Assn.*

July 5, Omaha, Neb.—Speedway races, Omaha Motor Speedway.*

July 9, Burlington, Ia.—100-mile track race, Tri-State Fair Assn.

July 31, Denver, Col.—Road race. Promoter, Chas. L. Newcomb, Jr.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 14, Janesville, Wis.—Track meet, Janesville Park Assn.

Aug. 20-21, Elgin, Ill.—Road races, Chicago Auto Club.

Sept. 6, Providence, R. I.—Speedway races. Promoter, I. E. Perkins.

Sept. 8, Kalamazoo, Mich.—100-mile track race, Kalamazoo Motor Speedway.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

THE SHOW CIRCUIT

Mar. 2-9, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association show; 23rd Regiment Armory.

Mar. 3-6, Watertown, N. Y.—Show; Armory.

Mar. 4-6, Springfield, Mass.—Show, J. H. Graham, manager.

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

Mar. 8-11, Johnstown, Pa.—Show; Auditorium Hall.

Mar. 8-13, Indianapolis, Ind.—Annual Spring Opening, Indianapolis Auto Trade Association.

Mar. 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

Mar. 8-13, Utica, N. Y.—Utica Automobile Trade Association show.

March 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers Association. J. Clyde Myton, manager.

Mar. 22-27, Bangor, Me.—Automobile show, Auditorium; A. P. Pierce, manager.

MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 10

New York, March 10, 1915

Ten cents a copy
Two dollars a year

A Brand New Assortment

HIGH SPEED
NON-GRAN
BEARING BRONZE

Cored-Bars for Bushings

Takes care of every bushing need to fit any shaft diameter up to $1\frac{1}{4}$ inches. Means less stock and more money for repairmen. The six different size Non-Gran Bars in this assortment make 54 standard and all intermediate bushing sizes. This little inexpensive assortment of genuine standard Non-Gran Bars provides for every one of the bushing sizes which any automobile repairman has most constant call for. There is not a single bar in the assortment which will prove a "dead one." Every repair-shop, machine-shop, or lathe-equipped garage in the country will recognize in this new assortment the best possible investment.

Special price on this new 6-54 Assortment is \$9.69 net (47 $\frac{1}{4}$ c. per pound) to the trade. Your jobber has this new Assortment or can get it for you.

New Low Prices on Standard and Near-Standard Size Non-Gran Cored-Bars

By effecting the most rigid manufacturing economies Non-Gran Cored-Bars are now offered to the trade at a price down so near the cost of inferior metals as to insure the use of Non-Gran in future in all cases where a bearing bronze is required—in fact, no man will now consider buying anything else but Non-Gran.

52 $\frac{1}{2}$ c. Per Pound Net to the Trade

List, 75c. per pound, with a discount on all standard and near-standard sizes of 30%, making a net price of 52 $\frac{1}{2}$ c. per pound.

Lasts Twice as Long as Any Other







Unlike phosphor and other granular bronzes the structure of Non-Gran is fibrous. The fibres are firmly interlocked and resist the pull of friction. This means slower wear—it means that Non-Gran lasts twice as long as the best of other bearing bronzes. It means none of your time or material is wasted. It means satisfied customers and a big increase in your repair business and profits.

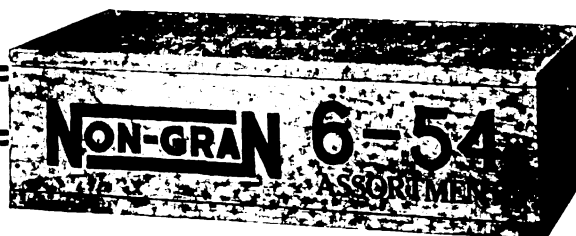
The finest work is but wasted effort if the materials used cannot "stand the pace," while the right sort of materials will add to the value of any sort of work.

ORDER NOW FROM YOUR JOBBER. If he can't supply you write us his name, send us your initial order, and we'll try to arrange with him for your future supplies. Do it today! Address "Dept. K."

American Bronze Company
Berwyn, Pennsylvania

These are the 6-54 Assortment Bars

-  "A" $\frac{7}{8}$ inch Solid
-  "B" $1 \times \frac{1}{2}$ inch
-  "C" $1\frac{1}{4} \times \frac{3}{8}$ inches
-  "D" $1\frac{1}{2} \times \frac{3}{4}$ inches
-  "E" $1\frac{1}{2} \times \frac{7}{8}$ inches
-  "F" $1\frac{1}{2} \times 1$ inches



An Outward Expression of Inward Worth

Honesty and sincerity are woven into the very warp and woof of MULTIBESTOS Brake Lining. In making it complete in our own factory we are mindful of the important work it has to do when finished and in actual use.

To us it is serious business—this manufacturing of an article upon which the safety of thousands of our fellow men depends.

It is so easy to be misled in the purchase of brake lining; so many have the same outward appearance, that we are now marking MULTIBESTOS with "White Foot Prints", or plain white lines which run across the fabric at intervals of exactly one foot.

Not only do these "White Foot Prints", protect MULTIBESTOS users; they also afford a great saving of time and inconvenience to the men in the trade who are handling it, for the marks are spaced exactly and can be used for measurement.

So, look for the "White Foot Prints"—the outward expression of true worth in brake lining.

Standard Woven Fabric Company

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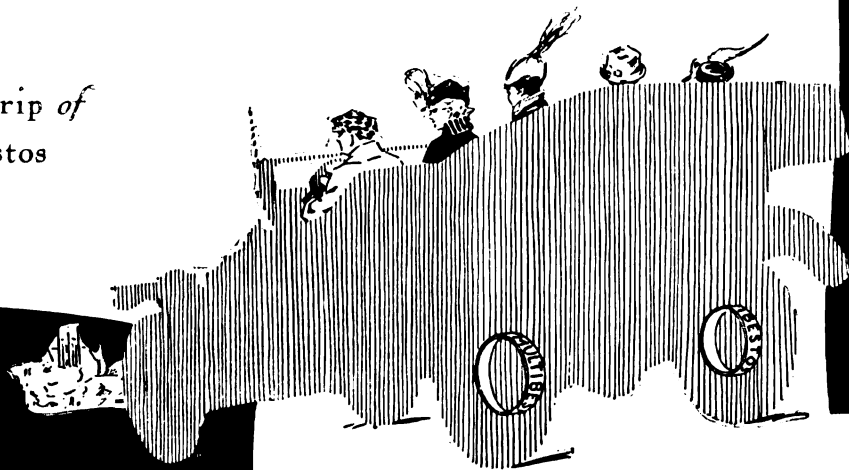
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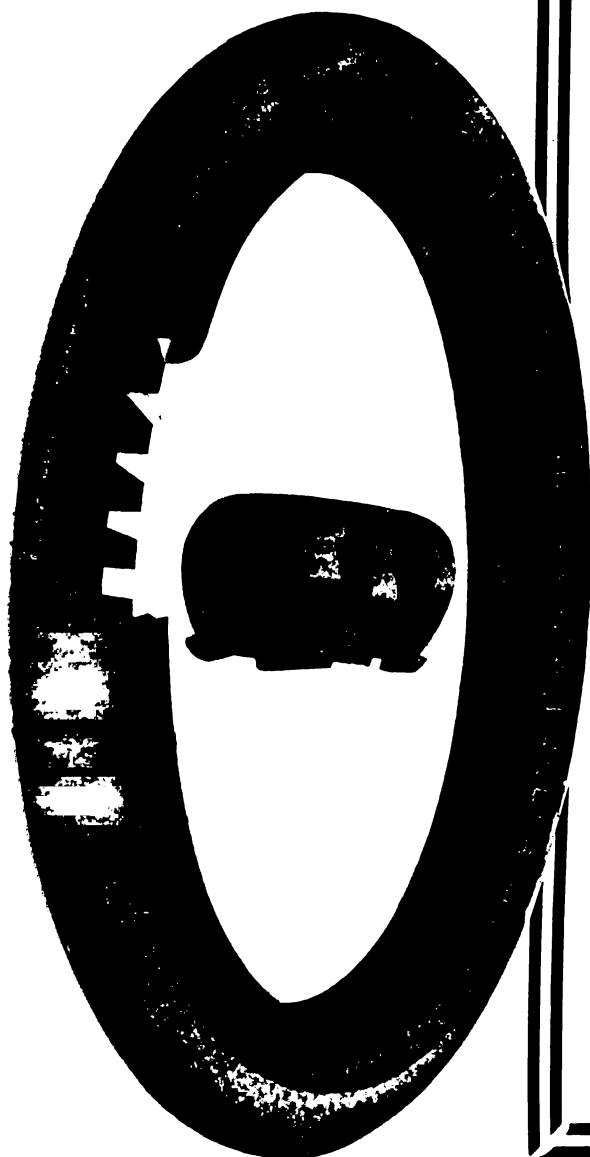
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Multibestos



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IT is an automobile tire that is neither pneumatic nor solid. In appearance exactly like the pneumatic, the DAYTON Airless casing is constructed of high grade rubber reinforced with fabric and supported on resilient rubber piers that carry the load. DAYTON Airless Tires cannot puncture, blowout or rim-cut; they eliminate the necessity of carrying spare tires, jacks, tire repair kits, pumps, pressure gauges, blowout sleeves, etc., etc.

Don't expose yourself to hardship, loss of time or probably the charity of others to help you change or repair tires. Equip your car with DAYTON Airless Tires and you will save money and forever dispose of motoring's bug-bear—flat tires.

A Real Guarantee

8000 miles natural wear on Fords or other light cars.

5000 miles natural wear on all other cars.

The average mileage of DAYTON Airless, however, far excels the guarantee.

Communicate with us at once as we have some exclusive territory open and a very attractive dealers' proposition that will make the DAYTON tire agency a real money making business.

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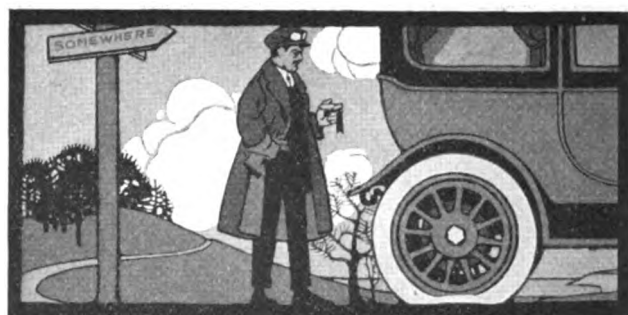
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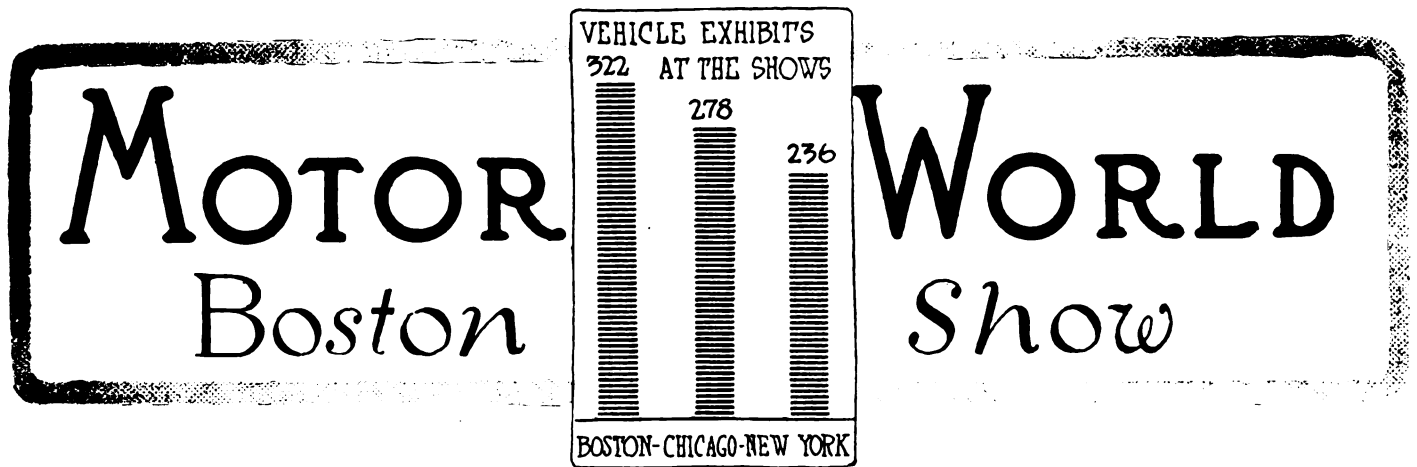
	1st	\$237,565		15th	\$296,725
	2d	254,020		16th	256,060
	3d	254,895		17th	271,645
	4th	263,140		18th	263,825
	5th	258,465		19th	273,530
(1/2 day)	6th	132,835	(1/2 day)	20th	188,770
	8th	266,920		23d	266,880
	9th	259,790		24th	285,080
	10th	265,800		25th	259,135
	11th	265,225		26th	267,995
	12th	264,360	(1/2 day)	27th	150,465
(1/2 day)	13th	137,725			

And the next day, March 1st, shipments amounted to \$330,185.00

These startling figures clearly express the attitude of the public. "Which car to sell?"—should no longer be a debatable question.

"Made in U. S. A."

The Willys-Overland Company, Toledo, Ohio



Vol. XLII

New York, U. S. A., Wednesday, March 10, 1915

No. 10

New England—Tool Room of America

Potential Part That Six States Play in an Industry That Reaches the Length and Breadth of the Land

HOW does New England figure in the motor car industry?

The ordinary answer to this question would be that New England takes a totally insignificant part, in that it has never figured to any great extent as a producer of cars.

This is true enough, without doubt, and it is true also that New England produces fewer cars today than it has done in past years, that the atmosphere of the six states does not somehow seem to suit the business in the same way as that of Michigan or Indiana, but if the factories of New England were suddenly to close down the automobile industry would find itself in a paralyzing situation.

Machinery the Key

New England is to the automobile manufacturer what the manufacturer is to the dealer, for to a very great extent indeed, it is from New England that the maker of motor cars obtains his supplies, not so much of raw material as of machines wherewith to shape it—and these are even more important than the steel and iron that can be bought in the open markets of the world. It is New England alone of all

the populated spaces of the earth that can provide the tools that have made the automobile a practical article of manufacture.

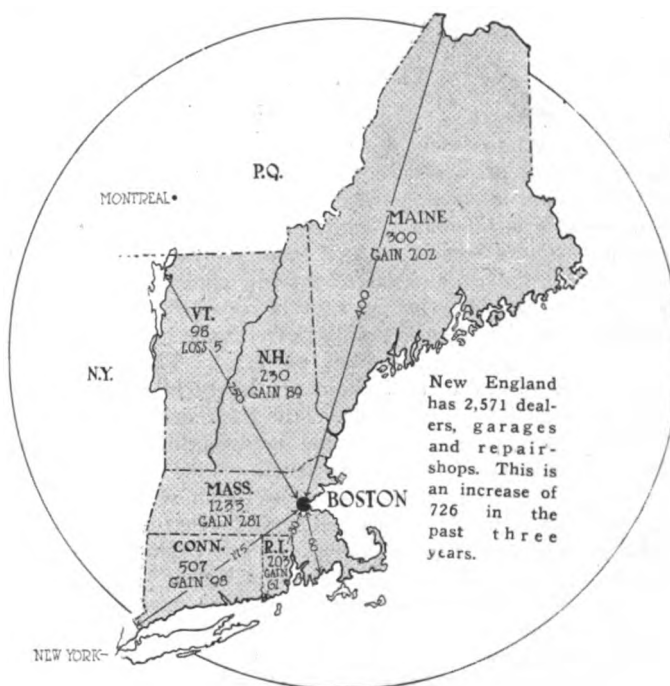
Nor is this all that New England can do, for the motor car, since as there are endless details that go to make up the modern road carriage, so are there endless interests behind those special parts.

One can scarcely think of a constructive art that does not find some expression in automobile make up and there is no article of any kind that is purchasable and usable by the ordinary man that contains a modicum of the mechanical skill necessary for the complete making of a car.

Skilled Labor Needed

Mineral matters provide the sinews, perhaps, but we could do little without the vegetable products of timber, and the skins and hairs of animals. In the metal parts we need the specially trained labor of the forge, of the machine minder, of the craftsman—all special and utterly different classes of skill.

Nor is the metal only either forged or carved to shape; it is used largely in sheet form, pressed, hammered, spun or rolled. Also each of these trades need to have the metallurgists, electricians, production specialists and even students of the arts of form and color.



In preparing this account of the potential part played by New England in the automobile industry, **MOTOR WORLD** had planned to visit the majority of the factories concerned. Their number is so great, however, that it was impossible to cover more than a very few within the limited time. Therefore, this article must be regarded as an extremely brief review of the subject.

There are in New England something like seven and a half millions of people and the bulk of these depend upon the mechanical industries of the six states; allowing for all possible deductions this means that there are hundreds of thousands of first-class mechanics in New England and they are doing for other industries the jobs that are too close in limits, too highly specialized or otherwise unsuitable for the more ordinary kinds of labor.

An automobile manufacturer may sometimes go to the extent of doing at least some of his own drop forging, but he would never think of laying down a plant to produce the lathes and milling machines for making his automobile parts, and the tendency is for a reduction rather than an increase in the number of trades which is pays to endeavor to house under one roof.

A manufacturer, whether of automobiles or other goods, turns naturally to New England for things requiring extreme precision, things where the skill of the worker ranks at least as high as the cleverness of the machine which he is handling; in a word, NEW ENGLAND IS THE TOOL ROOM OF AMERICAN MANUFACTURE—even perhaps of the factory of the world.

Thus, in some respects New England is more important to the motor car than any other part of the globe, though in passing, it is interesting to reflect that the thing is reciprocal, for New England is as important as a consumer of automobiles. Of its total population no less than 20 per cent are habitual users of motor vehicles, for in each hundred of men, women and children there are two owners of cars, and one may reckon on ten habitual users to each vehicle without straining a conservative caution.

However, this is by the way, though it is interesting as showing that New England exchanges much of its peculiar products for things it cannot make itself, just as two countries will exchange with each other food stuffs that their own climates or conditions make impossible of home production.

To examine more exactly the nature of the goods that New England gives in barter for its motor cars we may, for the moment, neglect the machine tools, because they are well known to be the typical trade of the extreme eastern states. Just to give a rough idea of the multitude of little things the automobile man needs and can find in New England, let us take some of the principal towns and cities and see what each one of them is doing in this line.

For example, let us begin with Hartford, a thriving Connecticut town, though the scene of some none too fortunate automobile ventures. Running down a list of names an early one to catch the eye is Billings & Spencer. Is there a skilled mechanic or an amateur repair-

man in the motor car world who does not know a "Billings," who does not think at least one Billings wrench or a set of Billings spanners an essential part of the ideal kit? If so, he must be somewhat of a curiosity, for the Billings tools for nut screwing are known wherever machinery is used.



Hartford the Home of Forged Parts

This is the side of the business that occurs naturally to the user or perhaps to the dealer, but the manufacturer of cars will think first of Billings & Spencer drop forged parts, for which the demand is such that the old Columbia factory has just been purchased to provide a site where the hammers can run day and night without shaking the inhabitants of Hartford in their beds.

Just now the forges are particularly busy upon the production of many other things than automobile parts, but the demand for these is always growing and is recovering fairly well after a small setback experienced last summer and through the fall.

Despite the huge sale of Billings spanners the forge side of the business is the more important in money value of product, and of this side an estimate puts well over half as going to the automobile trade. Probably nearly half the spanners also find their way to use upon a chassis, though the general hardware dealer figures so largely as a buyer from the maker that one can do no more than guess at this proportion.



Work That Requires Great-est Precision

Almost next door is the Whitney Mfg. Co., of whose considerable output the bulk is consumed by automobile makers. Here, 375 men and women occupy 150,000 square feet of modern factory floor area in the production of driving chains for trucks, for heavy touring cars of old type, for motor timing gears, for bicycles and for sundry other purposes. Thousands of feet of chain are lately in demand for starter drives and for driving generators, while some is used in the gearset of the Jeffery truck.

This chain making is precision work, of course, and it is difficult in that the number of parts that go to one chain is so very large. Testing is a feature of the plant, as all the silent type chains have to be run under power before the final inspection, and during this run they are so loaded that any weakness that had escaped previous inspections could not fail to show up.

There is, too, another side of the Whitney business, this being the making of hand milling machines, useful to the repair-shop, though designed primarily for cutting seats for Woodruff keys.

This is small, however, compared with the chain production. Business with the Whitney Mfg. Co. is in a very brisk and flourishing condition and the recent enlargements of the plant are being appreciated greatly since they enable the output to be kept up with the growing demand.

Quite a different branch of industry is the Hartford Rubber Co., now merged in the United States Tire Corp., but still operating as a unit. Business here is so flourishing that the plant has for some time past been running 24 hours a day, and it is expected that this rate of working will continue throughout the present year. This is upon the production of pneumatic tires only and something like half a million to 600,000 tires will be turned out before the first of 1916.

Yet another Hartford plant equally intimately connected with the automobile is that of the Veeder Mfg. Co., pioneers in the making of mileage registering accessories, first for bicycles and then motor vehicles, and still engaged on this and similar classes of manufacture. Again be it noted the nature of the product is possessed of the precision that is typical of New England. With the Veeder company business is good and the automobile trade demand in a satisfactory state.

In addition to the firms which already have been mentioned as claiming Hartford as their homes, there are the Kinsler-Bennett Co. and the Hartford Auto Parts Co. The former produces universal drives in considerable quantity and many styles and the latter turns out universals, cone clutches and other parts. Another company is the Maxim Silencer Co., which produces silencers.

No mention of Bridgeport would be complete without including the Bridgeport Brass Co. This company produces pumps literally by the ton, for practically every motor car manufacturer who is large enough to require great quantities. In addition, the company turns out tons of hub caps for such concerns as Ford, Maxwell, Studebaker, etc., as well as an equally great number of radiator caps.

Stepping across into the next state, Worcester is a place of prominent manufacturing importance, and here we find one of the oldest firms that has made a big mark as suppliers of automobile forgings. Crankshafts, gear blanks and axle parts going to the automobile makers form 65 per cent of the total trade of Wyman & Gordon, who began in the forging business in 1854 and were among the very first to make heat treated crankshafts for gasoline motors. These they supply mostly in the rough, but also make some finished, and they keep 300 men continuously busy at the hammers.

Another important factory in Worcester is that of Coe's Wrench Co., which was the first to develop the adjustable

spanner in its usual form. In 1840 the first patent was granted to Loring Coes for a wrench which could be adjusted by the hand that used it without the assistance of the other hand. The main part consisted of the head and handle forging and on this slid the adjustable jaw, controlled by a separate external screw threaded into the sliding jaw and abutting against a lug on the main member. This screw carried at its lower end a knurled head which was so positioned as to be convenient to the thumb of the man who was holding the wrench. In almost this same form the wrench is made today, and it has proved susceptible of many small variations, making it suitable for various special classes of use in many lines.

From the smallest of rented shops the business has grown till it now covers 36 acres of floor and employs 250 hands, while wrenches are made in all sizes up to 4 feet 6 inches. Though the automobile only accounts for a small proportion of the million wrenches made a year, still a good many thousand must find their way to the tool kits of vehicles and to the bench of the garage.



Where Stampings Are Turned Out Wholesale

Another Worcester concern of whose trade no less than 70 per cent is with automobile men is the Worcester Pressed Steel Co. This concern does not press frames, but makes almost every other kind of automobile steel part that can be made by squeezing the metal between dies. Notable among such parts are hub shells, axle housings, brake drums and cones or plates for clutches. Crankcase and gearset covers, valve enclosing plates and similar parts are prominent, and there are besides a lot of small things like grease cups and shock absorber parts that are suitable subjects for press work.

The firm is an old one, having begun with the making of cycle parts in 1883, and its factory now covers 100,000 square feet of floor space and employs 250 men. The first pressed steel axle housing was produced in 1909 at the very commencement of the demand for this kind of part. Trade here has been growing steadily and has been maintained through the past few months well up to standard.

Just as examples of smaller shops that depend largely upon the automobile trade one might mention the department of the firm of Gratton & Knight, which deals with clutch leathers and other leather parts needed for automobile finishing—not including upholstery leathers. And another small concern of whose product many go to repair-shops is the Waldon Mfg. Co., who specialize upon socket wrenches.

This brief and naturally not complete review of Worcester's share in automobile trade supplies of course neglects its

machine tool production, which is on quite a large scale.

Taking a smaller town we may turn to Torrington, and here it is easy to pick out a round half-dozen companies in the field we are considering. In every chassis there is a fair number of small screws and bolts of standard size, and automobile manufacturers like Ford and Willys-Overland use up thousands upon thousands every year. The Progressive Co., of Torrington, have sold millions of screws to these two manufacturers alone, besides large numbers to other makers.



Center of Brass and Bronze Trades

Then, again, the Standard Co., of the same town, make huge quantities of the wire spokes used in the manufacture of automobile wheels; how large a proportion of the total number used it would be difficult to estimate, but it must be a very high percentage. The same company turns out 3,000 spark plugs a day, or at least they have been doing so and now anticipate a daily demand for 5,000 to last throughout the present year.

One would not read into the title of the Excelsior Needle Co. any likely connection with automobiles, yet it makes, in Torrington, all the small ball bearings used in Splitdorf magnetos, this undertaking amounting to 5 per cent of their whole business.

Another Torrington factory appealing more directly to the dealer is that of the Fitzgerald Mfg. Co., which manufactures three different kinds of warning signals; the electric vibrator type of horn, the motor operated horn and the mechanical or hand horn. The same firm also produces many gaskets, especially the elaborate copper and asbestos types used to make cylinder head joints, these being made in all shapes and sizes. Allied to the horn making they have a department for manufacturing brass terminals for electrical fittings and they do, besides, much sheet metal spinning for the reflectors of lamps and so forth.



Almost Insignificant Parts That Really Count

Fifth in the Torrington list may be put the Turner & Seymour Co., which makes the "Like-Leather" nail for upholstery, a good example of the kind of essential little detail that goes into the automobile, but which no ordinary man, even in the business, would ever think of.

Completing the half-dozen for this town is the Hendey Mfg. Co., which is a machine tool firm turning out a type of lathe useful to large repair-shops.

Although the city of New Haven does not perhaps loom quite as large as a manufacturing center as do some of the other cities in New England, it nevertheless has a number of highly important industries which have been built around

the growth of the motor car. One reason for this is that New Haven is within easy distance of Ansonia and Brantford and other centers where the brass and bronze and malleable iron casting industry flourishes. And, having excellent shipping and railroad facilities, it is not to be wondered that New Haven slowly but surely is coming to the forefront of New England's industries.

One of the noteworthy examples of the use that has been made of the proximity of the brass and malleable iron casting industries is to be found in the plant of the Westinghouse Air Spring Co. With all of the other Westinghouse interests centered in and about Pittsburgh, the question why this particular branch of the business was placed in New Haven is a natural one. And the answer is to be found in the reasons set forth above. Also, a great many of the parts that go into the make-up of the Westinghouse springs require highly skilled labor, and it is fairly well known that New England is the home of the highly skilled mechanic, whose specialty is the production of small parts.



New England Products That Travel Afar

The air spring department of the Westinghouse company was established in October, 1912, and in January, 1914, the present plant in New Haven was opened. The plant has two floors, 75 x 100. Raw iron materials are received on the lower floor, where part of the machine work is done, and brass and bronze castings are machined and the springs assembled on the upper floor. During the year gone by the company produced and marketed upward of 1,400 equipments, and for the year 1915 it is confidently expected that an increase of at least 40 per cent will be made. Of these 1,400 equipments, approximately 85 per cent were shipped out of New England to the various great automobile centers, such as Detroit, Indianapolis and Buffalo.

The body building industry is an important one and New Haven boasts three plants which do this work exclusively. The largest of the three is the New Haven Carriage Co., which first started operations in 1838, though it was not building motor car bodies at that time, its energies being devoted to the production of fine carriage bodies. In 1896 the company first entered the motor car body business, producing bodies for the old Pope electrics, now long out of existence. In 1900 the company commenced to devote its whole plant to the production of motor car bodies exclusively, every type, from the runabout to the stately berline being produced. Of its production, probably 60 per cent is shipped to factories within New England, the Locomobile Co. of America at Bridgeport getting a large number of

bodies. The company is capitalized at \$200,000.

The second body concern is the M. Armstrong Co., which was started in 1859, at which time the volume of business handled required the services of only two men. Eight years ago this company, too, started to produce motor car bodies exclusively, and at the present time the output is from 50 to 75 bodies a year, worth from \$50,000 to \$75,000. The company at present occupies a six-floor plant and is doing contract work almost exclusively for such well-known concerns as Mercer, Packard, Peerless and others. Approximately 33½ per cent of the company's output is shipped away from New England.



New Haven, the Home of Fine Bodies

A. T. Demarest & Co. probably are as well known in the motor car industry as producers of fine bodies as any other concern in the United States. This concern is located in New Haven, having been started as long ago as 1838, since when it has increased in size until at present it is one of the most important industries which the city boasts.

Among the other manufacturing concerns which devote a part of their plants to the production of motor car parts may be mentioned the Eastern Machine Screw Corp., which at present operates a factory having 15,000 square feet of floor space and produces a great quantity of screw machine parts. Not more than 10 per cent of the company's business, however, goes to the automobile industry.

The Kilborn & Bishop Mfg. Co. produces drop forgings of every variety, though like the Eastern company but a small amount of material is for the motor car industry. This concern was established in 1896, since when it has increased to probably six times its original size.



Where Radiator Manufacture is a Specialty

New Haven, like a great many other New England cities, has a great many large factories which devote but a part of their plants to the production of motor car parts. The Mayo Radiator Co. does a large amount of work for battle-ships and aeroplanes in addition to building high grade motor car radiators. The Mayo Radiator business, which has grown to such proportions and has become of such importance in the industry that Mayo radiators are known wherever motor cars roll over the roads, is housed in a modern plant close to a railroad spur which affords splendid shipping facilities. From an almost insignificant beginning it has grown to its present large proportions.

Among the concerns which are devoting but a small part of their plants to

motor car parts there are the Gilbert Mfg. Co., which produces tire cases and other fabric goods; the National Pipe Bending Co., which makes manifolds; the Seamless Rubber Co., which produces tires, horn bulbs and other rubber articles; Seward & Sons Co., makers of spring clips; the Barnes Tool Co., which makes wrenches, and Dann Bros., who produce door handles.

The importance of New England as a producer of small brass and bronze parts, is well emphasized by two companies which boast New Haven as their homes. One of these is Sargent & Co., which produces vast quantities of brass and bronze parts for the building trades, and the other is C. Cowles & Co., whose lamps and other motor car parts have earned for themselves a national reputation. This company is one of the oldest and best known in the lamp industry, having been established as long ago as 1838.



Bearings That Support Many Cars

A place with again a slightly different character is New Britain, where one of the most interesting factories at the present moment is that of the Fafnir Bearing Co. From this concern's plant 75 per cent of the output goes into automobiles, and the European embargo on the export of ball bearings will keep the Fafnir company very busy in common with all other American ball bearing factories. Although not reckoned a very large place, this plant turns out 1,500 bearings every day, these being of all the well-known and accepted types from the plain single row kind to the thrust and the annular types. A self-aligning pattern ought to be mentioned and the double row annular. Last year has been the biggest in the company's history.

Small screws and like parts—all products of automatic tools—were mentioned as among Torrington's contribution to the automobile, and in New Britain the Corbin Machine Screw Co., operating on similar work, sells a third of its output to the motor car trade. Another company with a similar title, the Corbin Cabinet Lock Co., furnishes body hardware, and from the huge factory of the Stanley Works Co. nearby it is said that from 30 to 50 per cent of automobile door hinges used in this country are turned out. This concern makes the concealed hinge which has become so popular and of which it is the inventor.

Buckles and hooks, of which a good many are used on top fittings, come from the North & Judd factory at New Britain, while there is another firm in the town which provides an illustration of the possibility of rapid success with a good article and may be quoted for the interest therein. This is the Hart & Hutchinson Co., which put up a building

18 months ago and commenced to turn out lockers in steel, for use in factories and everywhere that such clothes containers are needed. A special one for use in a garage so as to keep small parts, spare tires and so on from any chance of theft, is among the series of lockers made.

Just above, mention was made of the ball bearing industry, and at Bristol in New England there is a very large plant doing little else than to make automobile bearings, this being the New Departure Co., which is among the oldest bearing makers in America.

Here extreme activity prevails, and everything is prepared for a record year. Already the New Departure Co. has proved itself capable of making ball bearings complete in every part from the ball to the cage which will compete in durability and service with the imported bearings that have been so popular in America.

Also in Bristol is a plant whence come many valve springs and small springs of similar nature, this being the Wallace-Barnes Co. Considering the small size of the town a fairly large proportion of its inhabitants must be engaged indirectly upon automobile manufacture.



New England Surpasses in Accuracy

In Providence, beside the huge machine tool output of the Brown & Sharpe Mfg. Co., it must not be forgotten that this same company makes gearing of all kinds, especially, perhaps, worm gearing, in the manufacture of which it was a pioneer, having produced the first commercial worm gearing that could be called efficient. One does not, however, think so readily of this immense concern as a producer of cylinder castings or other cast grey iron parts, although this is quite a department of their trade. Naturally their interests are so wide that the automobile plays only a part in their field of enterprise, but the automobile owes a very great deal to Brown & Sharpe enterprise at the time when really accurately-made gearing became an automobile necessity.

Going from the vital essential to the accessory that improves or adds to a car, there is also in Providence a most interesting plant whence are despatched nothing but attachments and accessories for Ford cars. This is the Auto Parts Co. These range from replacement parts, such as brake shoes, to shock absorbers and tire carriers; from accelerator pedals to special running boards, and between these limits there are included a host of little things all useful, all simple and all inexpensive. The business has been built up by studying the need first and then producing the very simplest imaginable thing to fill the requirement, and the total volume of trade must be very large by comparison with the size of the plant.

Providence also possesses a little actual automobile making, since it is in its works in this city that the American & British Mfg. Co. manufacture a gasoline-electric tractor for fire service. The output is not large, but the work is a good deal heavier than most automobile manufactures; it is expected that about one tractor per week will measure the production this year.

In Providence it would be possible to find many firms having a more or less slight but distinct connection with the Detroit industry, just as has been pointed out in mentioning other towns, and the same is true of a variety of other places, such as, for instance, Springfield or Bridgeport.



Industry's Wheels Never Tire

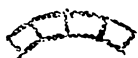
The former, of course, produces machine tools, but one of the machine makers—the Bausch Machine Tool Co.—is also a worm gearing maker with a large automobile connection. It makes both the straight and Lanchester types of worm and has devised special machines for grinding the faces of the worm threads. This has been done for years with the straight types of worm, but it has not been common on the other kind, owing to the peculiar difficulties introduced by the shape of the worm being a sort of double curve. The method used by the Bausch company seems to be entirely successful and is operated by a specially trained force of men highly skilled in this operation. Something like a third of the Bausch trade consists in the making of worm gears and the whole of the output goes to the automobile industry.

Another Springfield concern well known to the automobile world is the Springfield Metal Body Co. They are not quantity producers, but have done a good deal as originators of styles and have a fairly large business with dealers who want special bodies built for high-grade demonstration cars. Their latest production is an especially clever body with a permanent aluminum top of handsome appearance. This top has no side supports and gives clearer vision than is obtainable through the ordinary folding top, yet in a few moments windows concealed in the body will convert the car into a completely closed vehicle. This is the kind of work done in this plant.

The Bosch factory, which was completed in 1912, and in which three-quarters of a million magnetos are turned out in a year, has come into prominence from another viewpoint since the war brake out in the Eastern hemisphere. Formerly many magneto parts were imported from other countries, but since the war the products of the Springfield, Mass., factory are being sold in England,

South America, Africa, and elsewhere.

The Bosch factory is one of the concrete examples of where a modern factory layout has been utilized for big production. This plant has the necessary capacity for 1,000 workmen. It is of a cross-shape plan, four stories, basement and sub-basement, 315 feet long and 66 feet deep. It is a dust-proof, sunlit factory with the best of hygienic arrangements. It can be utilized day and night owing to the particular care for lighting arrangements.



Bridgeport, a Center of Varied Interests

Springfield is also the home of the Knox Motors Co., maker of the Knox four-wheeled tractor. This is one of the oldest concerns in the business. About 15 years ago the manufacture of a small air-cooled pleasure car was begun, and after producing two-cylinder cars for several years a four-cylinder, air-cooled model was put on the market. Only a few years ago the water-cooled principle was adopted, and after that both four and six-cylinder machines of high power were manufactured. About two years ago the company was reorganized and since then only a tractor has been produced.

Bridgeport has, of course, a directly traceable connection with the automobile by reason of being the home of the Locomobile. Yet, valuable though the output of this plant must be, it may be doubted whether it approaches 50 per cent of the value of Bridgeport's contribution. First, there is the Weed Chain Tire Grip Co. to be reckoned with as a very important factor, and next, one might safely place the Royal Equipment Co., which makes miles of Raybestos.



Annual Output of 10,000,000 ft. Brake Lining

This asbestos and brass wire woven fabric, together with the other brake linings, must be the automobile's biggest demand upon the textile industry, because though hardly recognizable as such, brake lining is woven on looms and treated just as any other fabric. The Royal Equipment Co. makes linings in many widths and also weaves specially for clutch plate facings and clutch cones, while they line brakes for several manufacturers. The business is an ever-growing one, more especially because lining goes to old cars as well as new. Roughly figuring, the amount used up annually brings one to a conservative total of 10,000,000 feet, and this is steadily increasing year by year. Of this huge total the Royal Equipment Co. makes a fairly large proportion, and a great deal comes also from another New England factory, that of the Standard Woven Fabric Co., of Framingham, Mass.

Besides the well-known names we have

mentioned there are others that at once suggest themselves to any automobile dealer as being New England automobile factories. For instance, the Stanley Motor Carriage Co., Newton, that has just produced a new model Stanley steamer. And in Meriden is the Connecticut Telephone & Electric Co., which produces the Connecticut automatic ignition apparatus in addition to great quantities of ignition switches and other similar goods; it may not be known that this company produces many thousands of telephones each year.

New England is the home of the clock and watch, and almost all automobile clocks are produced in this territory. The first of these concerns is the Waltham Watch Co., Waltham, Mass.; then there are the Boston Clock Co. and the Chelsea Clock Co., both of Boston, and the New Haven Clock Co. and the Waterbury Clock Co., in Connecticut.

One of the oldest Massachusetts industries connected with the automobile is that of the Fisk Tire & Rubber Co., at Chicopee Falls. This concern has built automobile tires since the beginning, and was one of the first to break away from the conventional clincher rim by adopting a special design by which the head of the tire was firmly bolted in place.



Where 100,000 Ford Lighting and Starting Systems Are Made a Year

In Boston there is, of course, the Gray & Davis plant, which did approximately \$4,000,000 worth of business last year. The plant in Boston, which is only one of the concern's factories, contains over three acres of floor space under one roof and employs 1,200 men. It is one of the very largest plants in the world devoted to automobile starting and lighting apparatus. An immense addition to their already large business is being found in the new Ford system, of which it is expected that 100,000 will be sold this year, and a notion as to the lamp trade is given by the fact that Gray & Davis turned out 400,000 lamps alone last year.

And so one could continue for many pages, for it would need a fair sized volume even to itemize the ways in which New England industry finds ultimate expression in the automobile, and an encyclopedia to give details of the output of the numerous factories wholly or partially employed on indirect automobile work. In these few pages it has been possible only to pick haphazard from amongst a very large number of concerns and only a small proportion have been mentioned, yet enough has been said to prove beyond all possible contention that New England could scarcely be of greater importance to the automobile manufacturer, dealer and user than it is today, despite the fact that it produces comparatively few cars.

New England Supreme in Machine Tool Making

Produced the First Fine Tools and Still Maintains Her Proud Position
as Leader—World Has Made Path to Her Door

NEW ENGLAND is the home of the machine tool; and despite the important place now occupied by Indiana as a competitor therein, New England remains the foremost producer of machinery for the shaping of metals into accurate forms.

There seems no particular reason why New England should have chosen to concentrate upon tool making, beyond the general laws of civilization; it was the first part of the country to be settled, the first part in which manufacturing industries were established, and so it naturally trained a population skilled in the arts of making the tools needed by the growing peoples of the other states who had their land to prepare, their homes to build and their towns to erect.

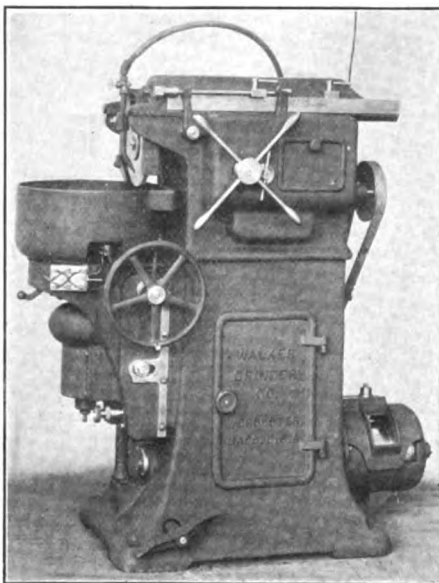
Machine Tools Made the Motor Car

The pioneer in the West sent home to the East for the things that he needed and could not make for himself, so the men who stayed at home soon became skilled in the arts of fashioning all kinds of weapons for fighting nature, from saws and axes for bringing vegetation into the control of man, to the drills and picks that were necessary to give him a like mastery over the wealth beneath the soil.

There are, of course, many kinds of tools, and each manufacturing trade needs only some of them; but the motor car is so complex a machine, calling for so many different kinds of skill in its completion, that it needs a greater va-

riety of tools than any other thing which can be bought for a similar price. Than any other common thing in the world, in fact.

That a motor car can be made for the absurdly small sum that it now costs to produce a good car is due largely, if not



One type of machine made by the Walker Grinder Co. It is provided with a magnetic chuck and may be used for grinding piston rings or similar parts

ing efficiency of lathes and of milling machines, of gear cutters and of drills.

As a typical example of this kind of thing there occurs the case of the Bullard Multitatic, a machine that has been developed from the vertical turret lathe. The Bullard Machine Co., Bridgeport, has specialized for years on lathes of this one class, and these tools are used in almost every automobile factory for the production of flywheels.

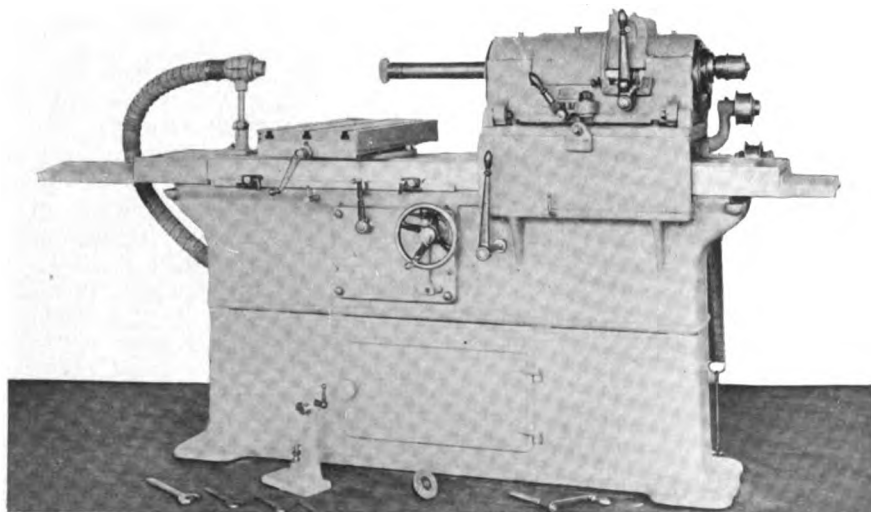
Formerly the vertical turret lathe dealt with one casting at a time and operated very much more rapidly than older machines used for the same job. Now comes the Multitatic, which deals with six flywheels at once and is saving Henry Ford \$250 a day by turning out a completely finished wheel from the rough casting in 1 minute and 44 seconds. Two of these huge tools can produce 1,700 Ford flywheels in each working day and all the attention they need is that of a man to lift off the finished wheel and replace it with the rough casting.

This means that the saving made in the Ford plant on the cost of flywheel making paid for the two big machines in about six months and left something over on the credit side. Of course, it needs a fairly large output to keep such a machine employed profitably, but there are several more on order and some of them for plants of a totally different character to that of the Ford company.

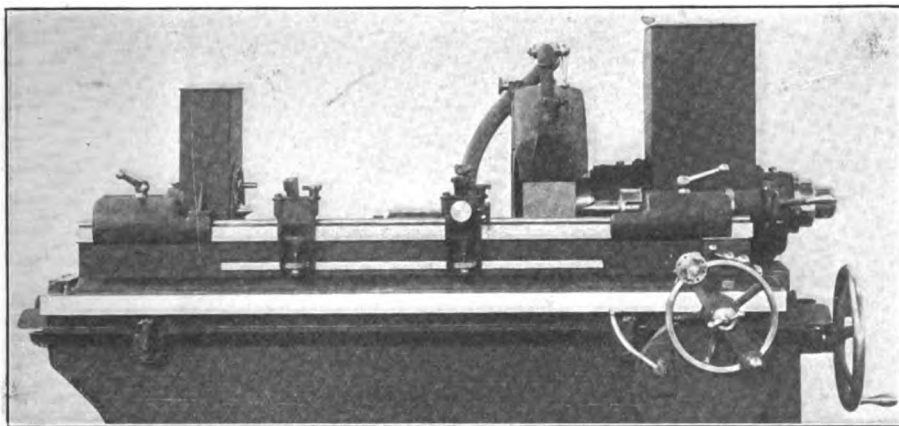
Better Drills and Grinders

Another tool that has been used very extensively by the automobile trade is the multiple spindle drilling machine, and there are a good many firms in New England making this class of tool. At Hartford, for instance, is the Henry & Wright Mfg. Co., which makes nothing but comparatively small drilling machines and sells something like a quarter of their product to the motor manufacturers. In this tool one finds another instance of labor saving improvement, since the drills are furnished with an automatic feed that can be used on repetition work instead of the hand lever feed, a simple operation sufficing to change the machine from one setting to the other.

The greatest change that has come over the average machine-shop in recent years and over the automobile plant in particular, is the ever growing substitution of grinding processes for cutting



A Brown & Sharpe product—a 7 by 14-inch cylinder grinding machine



Special grinding machine with wide-faced wheel which is housed and provided with an exhausting connection to carry off the particles of abrasive and metal

operations. It is surprising what a short time ago it really was that the emery wheel came first into a practical form upon the markets of the world, and equally astonishing that an apparently simple invention should have such a profound effect on manufacture.

In the early eighteen eighties the first Norton emery wheel was made and the Norton Co. was incorporated. From the smallest of commencements there has grown up in Worcester the Norton Co., which makes grinding wheels, and the Norton Grinding Co., which makes machines to use the wheels, besides several other concerns also making machines for doing special grinding work.

Emery, of course, was not altogether an ideal material for grinding large surfaces, and the coming of the electric furnace led to the creation of fresh abrasives of greater cutting power. A grinding wheel is made up of millions of little grains of material with sharp edges each of which acts on metal like a tiny cutting tool, and by using different materials one can get different degrees of sharpness or different angles on the edges of the grains to suit different kinds of metal.

Abrasives for Every Need

Every lathe hand knows that cast iron and steel need different kinds of cutters and that brass needs still another variety of cutting edge. All these requisites can be filled by grinding wheels made by the fusion of different materials in the electric arc and with different kinds of subsequent crushing and binding into wheel shape. One of the troubles with the mineral emery was that it did not run uniform and the first important Norton discovery was called Alundum, being an artificial reproduction of Corundum, another mineral like emery but less easy to obtain.

Taken in the lump from the electric furnace, Alundum can be prepared into different grades, and is a favorite material for grinding steels, while for materials of lower tensile strength the Nor-

ton company makes Crystalon, another electric furnace product.

Besides making machines to use the Norton wheels on crankshafts, on camshafts, and on many other automobile parts, the Norton Grinding Co. has also done a big business with its rotational balance machine for eliminating errors in balance of crankshafts and flywheels.

Huge Business in Grinding Machines

Of the Heald Machine company's output a very large proportion goes to the automobile trade, and there is no very great quantity of cylinders that has not made acquaintance with a Heald grinder. As showing the general activity of the trade, this concern has found the demand for its tools during January of this year to be vastly ahead of similar returns for 1914. A special cylinder machine, known as No. 60 is made, which has been designed especially for use in repair-shops, because it can be adjusted to regrind cylinders of almost any sort or size. It is a tool that any intelligent mechanic can handle.

In the same town there is the Walker Grinder Co., making special machines that complement the Heald tools, by producing piston rings, and in Providence, R. I., is the huge business of Brown &

Sharpe, making grinders of all sorts, to do almost any kind of job. Probably Brown & Sharpe grinders are best known in their "universal" form, but they make fair quantities of cylinder grinders and other special models.

In the automobile trade the firm is most famous as a gear cutting machine maker and producer of finished gears, especially worms. This company has one of the largest machine tool factories in the world and turns out tools of a great number of kinds. No doubt the company's reputation has gained a good deal from the educational work done, for it has been responsible for the issue of books on gearing that have become standard works for engineers and are still the authorities on many subjects

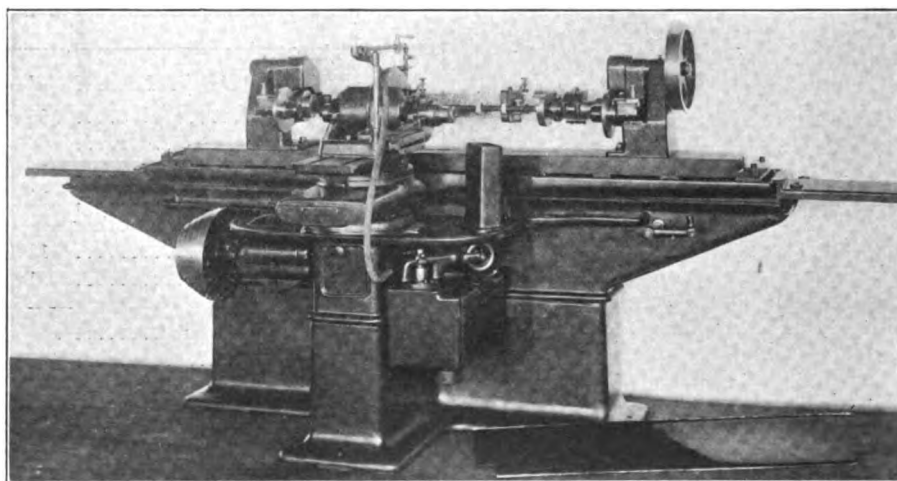
Gears an Important Specialty

In Hartford is the huge plant of the Pratt & Whitney Co., which turns out all kinds of tools, and the subsidiary small tools department that turns out taps and dies and small tools.

In Springfield, Mass., the Van Norman Machine Co. makes a milling machine that appeals especially to the repair trade, since it is designed to cope with a great variety of work. In Springfield, Vt., is the Jones & Lamson Machine Co., whose lathes figure largely in manufacturers' shops, and from the same town comes the famous Fellows gear shaper that has the reputation of making the most accurate spur gearing obtainable.

One of the most useful tools ever offered to an automobile maker is the Potter & Johnson automatic tool that can deal with almost any sort of automobile part, and this, too, comes from New England—Pawtucket, R. I.

The Grindley automatic is a somewhat similar and almost equally popular tool and has its origin in the shops of the Windsor Machine Co., Windsor, Vt. In Connecticut again the New Britain Machine Co. make various special machines for the motor industry, while from Hyde Park, Mass., comes the Becker milling machine.



Another Brown & Sharpe product—a universal grinder arranged for grinding camshafts



A view across Exhibition Hall, showing the temple at the intersection of the aisles which raises its gilded dome 25 feet above the cars displayed on every side of it; on the rear wall there is a painting of "The Acropolis"

Boston's Greatest Show Holds the Stage

Thirteenth Annual Proves More Powerful Magnet Than Ever—Merchandising Displays a Feature—Sales Campaigns Assisted By Record Attendance.

THE Boston show—the greatest dealers' show in the world—is on this week. It opened Saturday afternoon with the interest and enthusiasm which always has characterized the Hub's exhibits and the spirit manifested by visitors and exhibitors points to a good year for the trade in that territory of which Boston is the center.

There are several features which distinguish the Boston exhibit. First, it is a dealers' show of national proportions. It ranks with New York and Chicago—and even surpasses them. It includes a truck show, which is the greatest commercial vehicle exhibition in America today, or for that matter, in the world. It is by far the prettiest show held this year. The accessory department is a show by itself, and, best of all, the exhibition produces volumes of real business.

The exhibit is staged in a double building—Mechanics Building and the Exhibition Building. The former is styled Grand Hall and is regarded as the major structure, but the exhibits are equally divided as to importance, and

some of the largest dealers and highest-priced cars are in the adjoining structure. Grand Hall is a triangular building, while the other is rectangular. Above both are galleries and usable second floor space which is crowded to the last inch with accessory exhibits. In fact, some of the second floors are used by car dealers who were unable to find

space on the main floor for their displays.

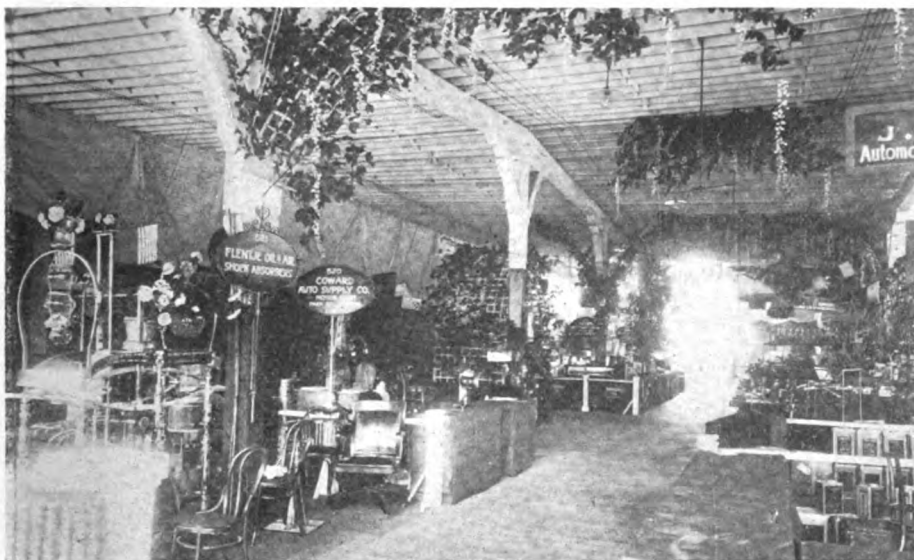
And there are two basements, also. These are devoted largely to the trucks, but, as is the case in the galleries, there is a sprinkling of passenger vehicles, while the ubiquitous accessories are omnipresent.

The Boston show draws from a large territory. The area is not, of course, so great in extent as that which centers about Minneapolis and Kansas City shows, but it is a live, buying population in a comparatively congested state which makes this exhibit its Mecca.

The fingers of the motor car trade extend from Boston to the furthestmost parts of Maine, reach northward to the boundary lines of Vermont and New Hampshire, stretch westward over practically all of Massachusetts, cover most of Connecticut and include the little midget of the Union, Rhode Island. A few other cities in this area have shows of their own, but—except with those near New York—the Boston show is the big motor event of the year and the dealers and buyers flock to Boston for this annual function.

STATISTICS OF THE SHOW

Touring cars.....	134
Runabouts	59
Sedans	10
Limousines	19
Coupes, cabrioletes and other enclosed types.....	11
Armored car.....	1
Total complete cars.....	234
Chassis	39
Motor exhibits.....	6
Electrics	7
Trucks	81
Total units.....	367



A glimpse of the accessory display where the aisles have been turned into flower gardens

New England, of course, abuts on the New York state line on the west, but, being a geographical division unto itself, Boston occupies a position as the distributing center of the area; some of the Boston accessory jobbers even selling goods on the Pacific coast, and a few are looking now toward a mail-order business. One jobber who is exhibiting stated that his business is by no means confined to New England itself. He and his partner travel the territory west of Denver with regularity and compete with the jobbers of San Francisco and Los Angeles.

Individuality in Exhibits

This adds all the more to the importance of the Boston show. It lends still further a national aspect to an event which is promoted by dealers and is shared in only by those business men who are classified strictly as dealers.

The influence of the dealer on the show is exemplified no better than in the variegated ensemble of the display. Each exhibit, to an extent not found in the national shows, bears some little touch of individuality; there are special show cars of unusual colors or body design, and arrangements and fixtures—which are not permitted in the national exhibits—are used to good effect.

Somber hues have been supplanted by such colors as the grays, blues, reds and greens of special bodies; some dealers took stock jobs into their service stations, and when the vehicles emerged they were far from the plain black cars which went in. They came out with spokes and bodies trimmed in original manner and naturally these cars are sought by buyers.

Cole is showing a gray car with red wheels; Mercer has a touring model in a dull black; and the Maxwell space shelters a roadster of canary yellow with black trimming, a light gray touring car

and a cream colored stripped chassis.

In the Locomobile space is a striking maroon touring car; Peerless displays a town car of café au lait color with sides of basket-work. There is a cream-colored Winton, with a black line around the top of the body, and a touring model of slate color. Among the Whites is a touring car of an attractive aluminum finish, and the Lenox has a bright red roadster with wire wheels.

Many Special Exhibits

Many of the dealers have beautified their exhibits by special constructional work and fixtures not provided by the show management. One of the Nationals is surrounded by a low lattice fence intertwined with foliage; at the corners are posts about which the foliage is arranged, setting the exhibit off as a distinct attraction along the broad aisle.

John H. Johnson, the Buick dealer, is, as usual, the leader in striking effects;

his exhibit has been arranged at a cost greater than that expended by the other dealers—but he states that it is a paying investment, basing his assertion on his experience at previous shows.

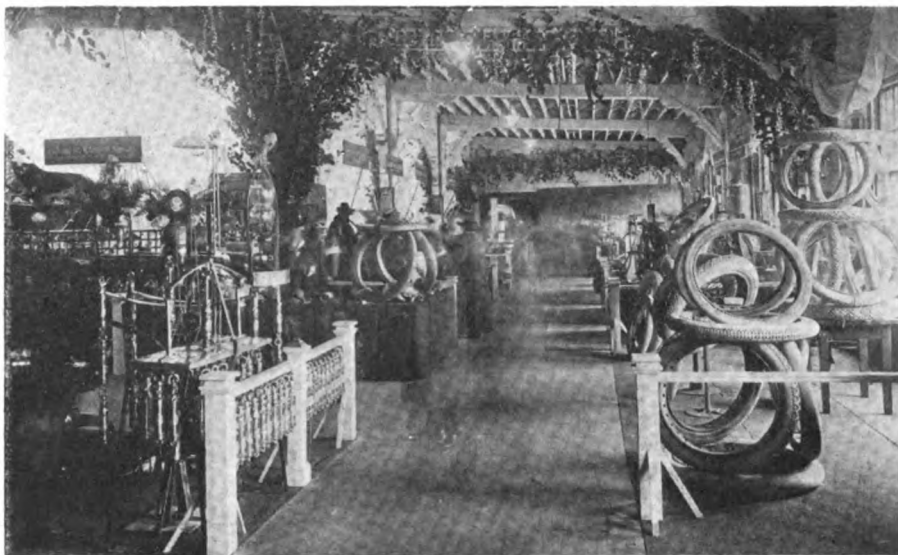
In one corner of his space is a cream-colored car, surrounded by a brass tubing fence; the car rests upon a buff-colored rug and above it and between it and the aisle hang inverted trough lights of old-fashioned hammered brass, which cast a strong white light down upon the car of unusual hue.

In another corner is a brightly polished chassis. The rear of this is enclosed by a nicked tubing fence and rests upon a rug. The turntable, which is a part of the Buick salesroom fixtures and which occupied the same position last year at the show, is again present, this time turning slowly around a bright blue roadster. There are stock cars of stock color, of course, but these things make the exhibit stand out.

Packard's Armored Car

The Packard exhibit is thronged by crowds, who stand about an armored car. This is a 2-38 chassis bearing a sheet metal body of dull gray, topped by a turret through a slot in which protrudes a small rapid fire gun. The driver is entirely sheltered with parts which lift and afford him ventilation and a view ahead and to the sides. The gunner sits upon a suspended bicycle saddle. The hood is covered by sheet metal and over the front of the radiator is a door which may be opened by a lever from the inside. The body construction is not complicated, being largely a shell in which is driver's and gunner's apparatus. But it is of unusual interest at this time.

It is stated that the company has thus far built three; one is at the Panama-Pacific International Exposition, another has been shipped to Europe and the third



Another of the accessory aisles, showing how well a display of tires fitted into the decorative scheme and harmonized with it

is the one on display. More are being built on order for one of the Allies. Lecturers draw audiences to the Cadillac and Chalmers exhibits, and in many others there are special trays of parts, moving devices and other attention arresters.

Eye-Catching Accessory Displays

In the accessory division one dealer arouses an unsatisfied curiosity by means of a common electric lamp bulb which is in some way glued to the top of a glass windshield, which has no metal binding on the edge; the lamp lights and goes out with rapidity and the crowd stops to figure out where the current is. They even go up and inspect the windshield at close range without finding the why. The current passes through a little platinum wire which is concealed upon the back edge of the glass. The wire is so bright and so small that it is very hard to find—but it does the trick.

Demonstrators of the devices have become recognized as a valuable asset in an exhibit; the majority of the exhibitors who have tools for use about a car employ a man who continuously operates them for the benefit of the show visitors. There is nothing so convincing to the prospective buyer as to see the device used. But many of the exhibitors are jobbers in supplies and accessories who cater to the army of dealers from New England who scrutinize the show for new things. Contracts for the coming year's business in accessories are frequently placed at the show.

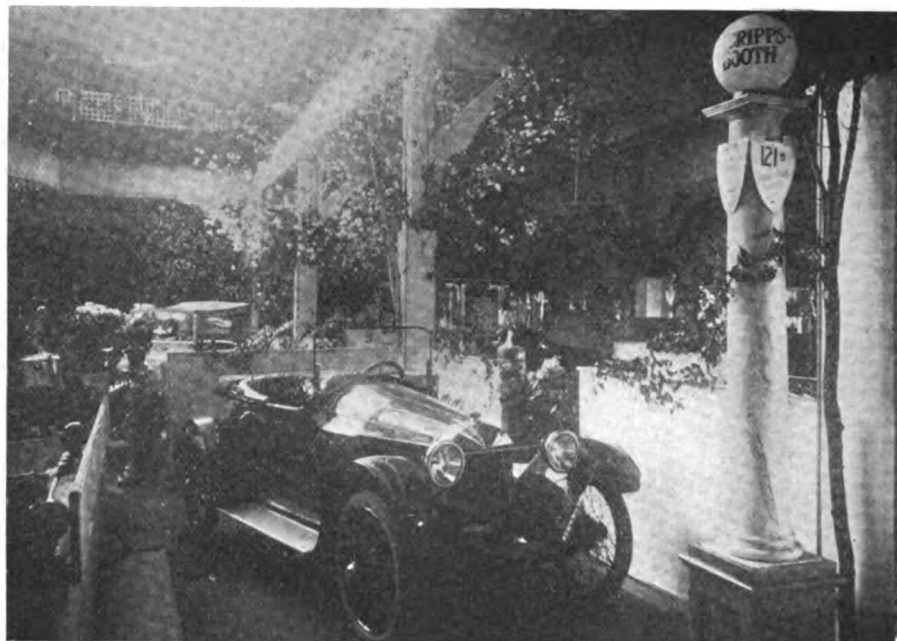
SALESMEN ACTIVE; SPURRED BY DEALERS

Prospects Secured Mean Sales Somewhere in a Dealer's Territory

The show being an important part in his year's sales work, the dealer makes the most of it. It is not difficult to draw a comparison between the sales planning at this big dealer show and the New York and Chicago shows. In this case the man in charge of the exhibit is the man whose money is in the business and who expects the show to play an important part in the future months' results. For this reason the sales work is of a more energetic type.

Salesmen are not permitted to congregate at the backs of exhibits and chat to the detriment of the exhibitors' show business. Each prospect secured at a strictly national show may mean a prospect for some distant dealer, but the prospects secured at the Boston show are prospects for cars which are to be sold in Boston; or if not in Boston they are in the majority of cases sold by dealers who buy their cars of the big Boston distributors.

All through the exhibit is seen this closer interest between the men in the



Scripps-Booth roadster with a background of oleander blossoms on branches and twigs, and azaleas

exhibits and the results to be obtained. Sales work in many cases is laid out on a definite plan. Certain men must be present at certain times, and instructions are that no interested person shall wander through the space unaccompanied.

Few New Agencies Established

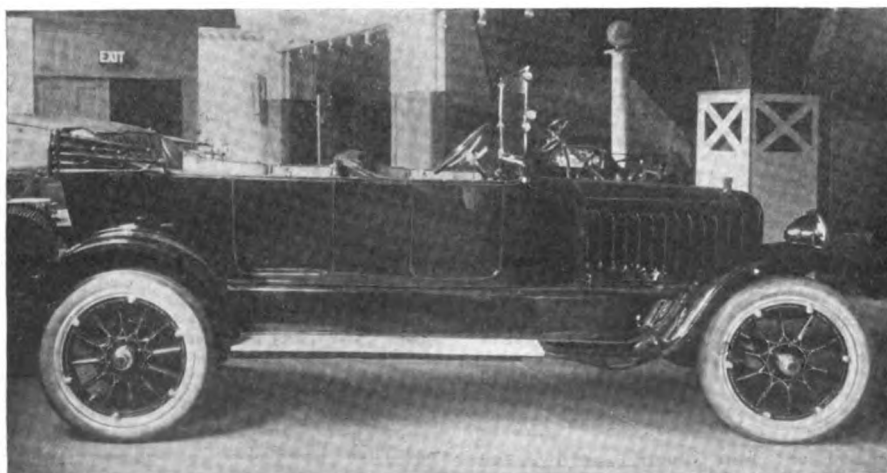
The business between dealers in the New England territory and the Boston distributors is not so large as might be anticipated. With such established agencies as the Pierce-Arrow, Packard, Buick, Jeffery and others, the territory is now well covered by dealers; there is no great need for further sales representatives. The dealers in these cars do not look forward to the signing up of many agencies, but dealers in lines which are newer to New England, such as Lewis, Allen, Scripps-Booth, Moline, Auburn and others, enter the show in the expectation of supplementing their agency lists.

However, the dealers from the terri-

tory use the show as a business lever; some of them have subdealers who they bring to the show; others bring in prospects and use the distributor's display and sales force to close the sale; it is not always regarded as good sales work to take a nearly closed prospect to a show, but several sales are made in this way.

Many Sales Made Early

Aside from its function as a trade tonic—which is the generally accepted value of a show—there is real business done by the Boston dealers; several reported sales made immediately after the opening of the show. In one case a sale was made to a man who had not been previously listed as a prospect; he never was on the dealer's records—one of the unusual instances in car selling. How many sales will be made by Saturday night is problematical, but results thus far indicate that to many dealers the exhibition will have been worth while



New Stanley steamer which resembles a gasoline machine; the radiator is used as a condenser

in this respect alone, and they are making the most of their opportunity.

Three hundred sixty-seven separate units comprise the exhibits in the car section; the details are shown in an accompanying table. The greater part, of course, are touring cars, with runabouts or roadsters next in number. One of the points which seem to indicate a trend in preference of car owners is the number of two-passenger enclosed types; among these are quite a number of enclosable runabouts or cabriolets, which can be either open or enclosed vehicles. The desirability of such vehicles has long been conceded and they seem to be stepping into their own in Boston.

Two foreign cars, the Rolls-Royce and Renault, are shown; a Rolls-Royce, also, is exhibited in the lobby of the Copley Plaza Hotel.

Show Catalog a Feature

The cataloging of the Boston show is a feat worthy of emulation; one of the first things which strikes the visitor's eye as he enters the building is—at the left—a regular office building directory on which is the name of every exhibitor and his space number. This is but one feature; the catalog itself is another.

This is a book of 112 pages—and it is not all advertising, either. The book contains an alphabetical list of the exhibitors with their space numbers, and there are charts showing where these spaces are. There is another division wherein are listed the names of the cars exhibited, and their space numbers. Another division treats the trucks similarly. Then come the musical programs for the whole week.

The Boston traffic rules occupy three pages, and then comes the unusual part of the book; enumerated in order of space numbers are the names of the exhibitors, with a detailed description of what each dealer is showing. Space 1 is the Packard; the catalog states that

this company is showing four touring models and it gives their specifications and prices. This is carried out even to the accessory exhibitors; wherever possible the catalog enumerates the accessories which the exhibitor features. In the back is an index to advertisers. It is a most complete book.

Stanley Streamline Steamer

One really new thing disclosed by the show is a Stanley steamer; there are certain mechanical refinements, but the greatest alteration is in the supplanting of the old rounded-nose front by a gasoline-car front end; the body is of a modified streamline type with fore doors, flush sides and a cowl dash. To the observer it is not apparent that the motive power is steam and not gasoline.

At the front is a radiator, which is employed as a condenser; unless the car is running it is dry. It has been found possible to use this through the use of a special lubricant containing graphite and kerosene, avoiding the deposit of

scale on the radiator due to impurities of lubricant or water.

The one other new thing is the Packard armored car; there is nothing unusual to the chassis except that the tires are solid instead of pneumatic, as they appear to be.

A vehicle not seen at other shows is the Lenox; this is made in Hyde Park, Boston, and practically all of them are sold in that section of the country; much of the body work is special and the owners are always in comparatively close touch with the factory itself; in this respect the Lenox is similar to the Moyer, which is made in Syracuse, N. Y., and sold in a nearby territory where the owner may at all times be in touch with the factory and its service.

THIRTY-THREE MAKES OF TRUCKS ON VIEW

Four-wheeled Knox Tractor and Worm-Driven Packards Are Features

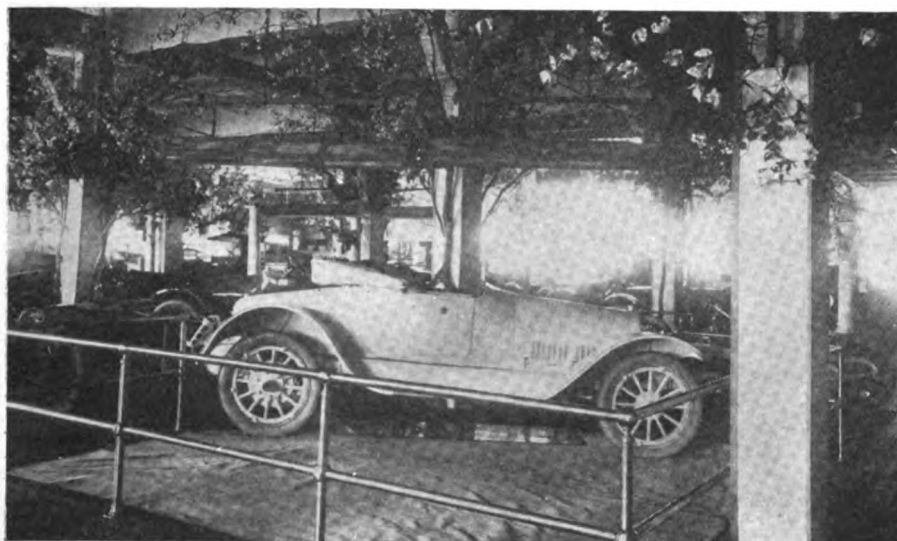
The truck show is especially worthy of attention; since the national truck shows were discontinued there is no big annual assembling of the truck industry's latest products; but here they are seen in the most modern stages of development. There are all kinds, from the little parcel-cyclecar to the big Knox tractor and a trailer which is nearly as long as the three Knox exhibit spaces and will carry 10 yards of earth or gravel and sells for \$5,700—\$4,500 for the tractor and \$1,200 for the trailer. And it is needless to add that these leviathans of the motor vehicle industry are accorded their share of attention.

In the display are the commercial models of 33 manufacturers, two of which are new, the Andover electric and the Howard. All told, 81 commercial vehicles are shown.

New things at the show are the two

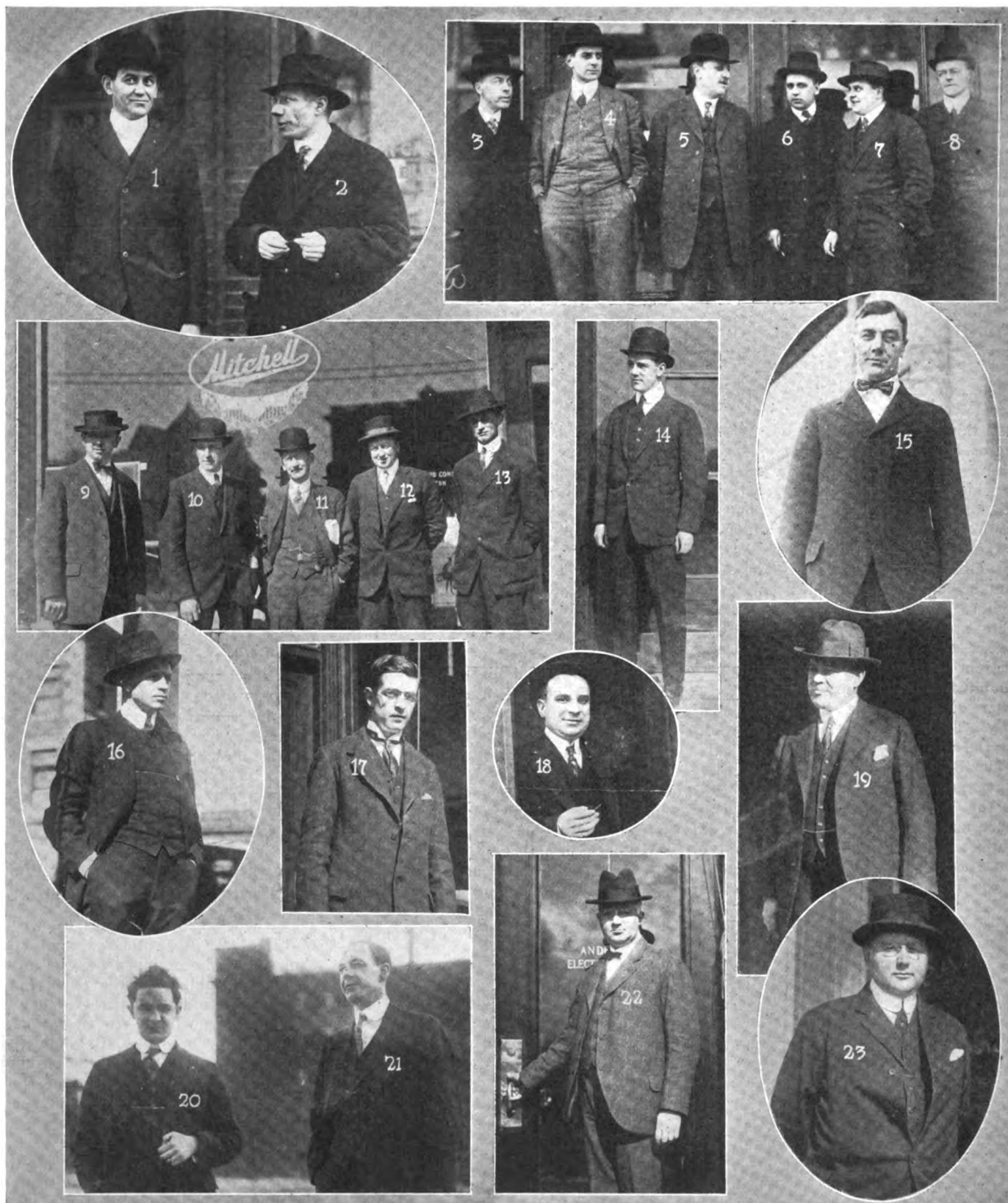


Aisle leading to Mechanics' Hall. An imported Fiat runabout is shown in the left foreground



One corner of show, depicting six-cylinder Buick runabout displayed in brass inclosure

Some of the Dealers Who Peopled the Boston Show

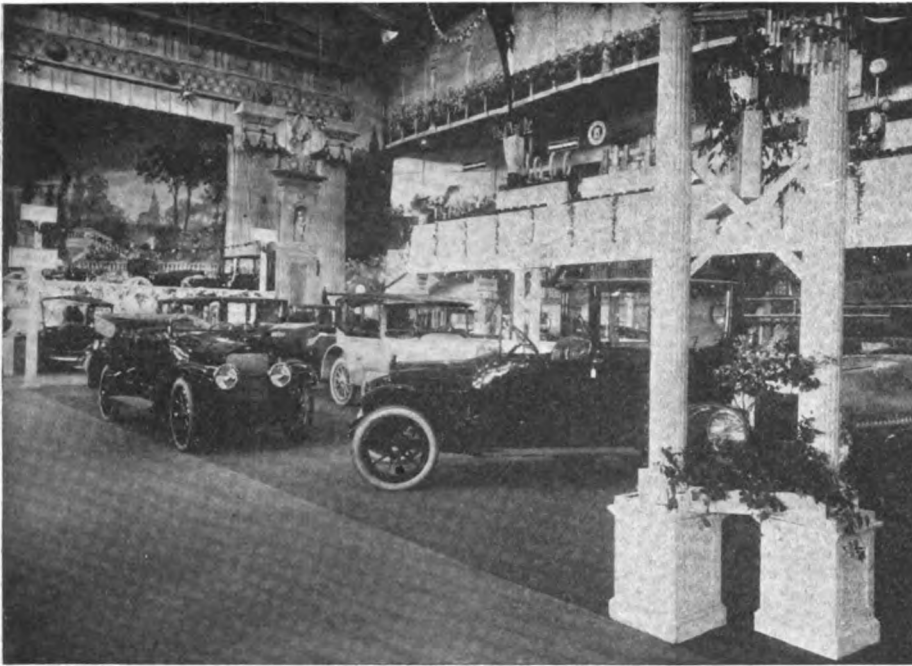


(1) George R. Bascom; (2) Frederick W. Wilkening, manager, Motor Parts Co.; (3) J. Q. David, district manager, (4) W. P. McKone, sales manager, (5) J. L. McKone, manager, (6) W. E. Chandler, (7) F. H. Keeney, (8) C. S. Morse, all of the Connell & McKone Co. (Overland); (9) A. A. Browe; (10) W. C. Masters, sales manager, (11) F. H. Lucas, general manager, (12) P. V. Sullivan, special representative, (13) F. J. Glaser, all of the Pope-Hartford Co. of Boston (Mitchell); (14) Charles S. Ward, manager, Ellis-Ward Co.; (15) F. A. Hinchcliffe, manager, New England Winton branch; (16) A. T. Hart (National); (17) Wallace G. Page, manager, New England branch, McGraw Tire & Rubber Co.; (18) S. L. Blood, manager, New England branch, Ajax-Grieb Rubber Co.; (19) Harry Fosdick, Wentworth-Fosdick Co. (Hupmobile); (20) Otto Lawton, (21) R. E. Frost, both of the Franklin Motor Car Co.; (22) Albert Weatherby, manager, Anderson Electric Car Co. of Boston; (23) Sherwood Hall, Jr., president and general manager, Paige Motor Co. of Boston

Faces That Are Familiar Along Boston's Motor Row



(1) S. Hardy (Mitchell); (2) Edward Becker, (3) M. F. Chase, (4) F. H. Freeman, all of the Stutz Motor Car Co.; (5) Lee R. Howe, assistant manager, Motor Supply Shop; (6) Ray Cavanaugh, proprietor, Motor Supply Shop; (7) Harry Pike, manager, Chalmers Motor Co of Mass.; (8) V. P. Whelan, vice-president and general manager, H. S. Waite Co. (Grant); (9) G. T. Arrington, (10) R. H. Wheeler, sales manager, (11) W. L. Russell, president, (12) W. D. Porter, (13) H. P. Bisbee, all of the W. L. Russell Co. (Haynes); (14) E. O. Hayes, Hayes-Johnson Co. (Pilot); (15) William Blanchard, sales manager, Lenox Motor Car Co.; (16) Frederick T. Moore, New England manager, B. F. Goodrich Co.; (17) John H. Johnson, Buick Boston Co.; (18) J. H. Cafferty, Boston manager, R. E. Taylor Corp.; (19) J. H. MacAlman; (20) E. G. Leighton, president, Massachusetts Motor Sales Co. (Auburn); (21) C. E. Soule, vice-president, Massachusetts Motor Sales Co.



One section of Grand Hall, showing the White exhibit and accessory displays in the gallery

new trucks mentioned, the new Knox tractor, exhibited for the first time, the new worm-driven Packards, the 3½-ton Federal and the Netco, all exhibited for the first time, and the Ford delivery car, which, after two years out of the commercial branch of its business, has returned to the delivery car market. Bodies are the feature of the truck exhibits as always, although a number of exhibitors showed chassis.

The new Andover electric is a radical departure from previous design in that its cab has been set well forward and very low between the front wheels, with the entrance through a front door. It is worm-driven on the rear axle, and its battery is suspended close under the rather rakish frame. The new Howard is a standard design.

Ambulance Has Unusual Features

Atterbury shows its new worm-driven chassis, the new feature of which for 1915 is cast case radiators on the larger sizes. The Autocar is shown in a number of chassis with different styles of bodies and one stripped chassis. The most interesting of the bodies is an ambulance intended for Red Cross service. This body is set low on the chassis, the rear wheels being inclosed in wheel housings. It has screened sides and roller curtains, and carries four stretchers. When not in use the stretchers are arranged to be carried on hooks at the side, longitudinal seats accommodating eight passengers.

The center of interest at the Jeffery booth is the four-wheel-driven chassis, the standard models being also exhibited. Knox tractors are shown in connection with two novel types of trailers, one of which is unusually long, being a

dirt wagon with two hoppers which may be dumped at the bottom separately. The other is a shorter type, arranged to dump at the rear, the elevating gear being carried at the front and acting by means of worm gears actuating a drum upon which hoisting chains are wound. It is equipped with steel wheels of the type employed on traction engines and agricultural machinery.

Smallest Packard Has Worm Drive

The feature of the Packard exhibit is the new worm-driven chassis, the 1-tonner being exhibited for the first time. This vehicle is the smallest truck yet put out by this Detroit maker, and while it is identical in layout and general specifications with the larger worm-driven Packards, it is much smaller in size.

On a 2-ton Reo chassis is shown a simple type of dumping body, actuated by toggle levers, the feature of which is



The Temple, at the intersection of the two main aisles in Grand Hall

great lifting leverage at the start of the lift, with a quicker movement as the body is raised and more of its weight has overbalanced the rear pivot. A bus body, with seats that fold up leaving a clear loading space for baggage or freight is the feature of the Studebaker showing, this body being a stock production and intended for hotel, summer resort and jitney bus service.

White Shows a Luxurious Bus

At the White exhibit, one of the largest among the trucks, three novel bodies are shown. The most interesting from the standpoint of current interest is a luxurious bus, mounted on a 1½-ton chassis. This bus is unlike others of its kind in that it bears no exterior resemblance to a street car, as most bus bodies do, but is constructed more on the order of a limousine. It is of unusual width, with flush sides and drop-sash windows.

The interior of the bus is upholstered in black leather with a soft dark-colored carpet on the floor. The eaves are somewhat lower than usual, giving the body rakish lines, headroom within being obtained by means of a trunk skylight which merges into the roof so as not to be visible either from the front or from the rear.

Entrance and exit have been provided by a door at the front on the right side, the door being of the sliding type and interconnected with a folding step, operated by a lever to the driver's right. The driver's seat is at the left, the bus being conveniently arranged for one-man operation.

Another interesting White creation is a special body for the Clearing House Parcel Delivery Co., of Boston. This concern operates a cooperative delivery business and has something over a hundred vehicles, it is understood. The body was arranged especially for the handling of a large number of packages of light weight. In this connection it must be understood that the average panel body, constructed more for appearance than utility, is seldom loaded to anything like capacity because of the light weight of the packages and the limited capacity of such bodies.

Special Parcel Post Car

The body is of unusual width, and equipped with two longitudinal shelves within, providing the maximum carrying space without superimposing packages one upon the other. On the outside, along each side, are racks for the accommodation of lengths of matting, carpet and the like. At the front is a seat of unusual width, designed to accommodate the extra helper often carried to expedite delivery. The entire front of the load-carrying portion is open, permitting the packages to be unloaded from the front.

Whom New England Delights to Honor

Some Great Industries That Have Grown From Small Beginnings to Become Towers in the Trade

GRAY & DAVIS BEGAN WITH \$3,000 CAPITAL

For 1915 Will Turn Out 200,000 Starting-Lighting Outfits

There were not many motor cars running 18 years ago, yet William Gray saw the possibilities of the industry so clearly that he formed a copartnership under the style Gray & Davis, for the purpose of building lamps for motor cars, and lamps only. As an indication of the size of this industry at its start, suffice it to state that Gray put up \$300 and his partner invested \$2,700. Last year, the company did a gross business of between \$4,500,000 and \$5,000,000. It manufactured more than 400,000 electric lamps and 100,000 complete electric lighting and engine starting systems.

The first factory was located in Amesbury, Mass. Naturally, it was a very small brick building, and the production was about ten sets of lamps a week. At that time Amesbury was one of the big buggy and carriage centers, and it is quite possible that it was for this reason that the new lamp factory was inaugurated in that little town. In those days it was customary to receive from \$75 to \$100 for one set of lamps, and they were a very costly part of the car's equipment. In 1899 it became necessary to enlarge the first factory to quite an extent.

First Dynamo Made in 1908

It is not generally known that Gray was a pioneer in the production of electric systems for motor cars. As long ago as 1907 he realized that the motor car was the most modern means of transportation, yet paradoxical as it may seem, the motor car was lighted by archaic, prehistoric methods—the open flame, oil, and gas. This certainly was not progress, and the lamp manufacturer set about to construct a system which would provide self-illumination for a self-propelled vehicle. In 1908 the first Gray & Davis dynamo made its appearance. This was at the show in New York. It created a great deal of interest, but was deemed impracticable for the reason that a similar device had been tried abroad and proved to be a failure. Fur-

thermore, the chief difficulty was in building a small dynamo capable of overcoming the variable speed of a motor car engine, and which would be compactly placed beneath the hood of the motor car.

It was very easy to design a large dynamo which would meet all requirements, but such an instrument would weigh perhaps 300 or 400 pounds, and, of course, could not be taken care of on the motor car.

Larger Factory Became Too Small

Gray persisted, however, and it was not long before the Peerless company adopted his lighting system. It proved very efficient, and then began the era of electric lights, to be followed shortly after by the production of a combined lighting and cranking system.

As time went by, the lamp factory was greatly enlarged until it now comprises six large, spacious buildings of mill construction. With the coming of the Gray & Davis dynamo, it became necessary to have a plant devoted to the exclusive production of the dynamo. Gray & Davis then moved into a large, modern factory situated at 55 Lansdowne street, Boston. This soon became too small, and the new Gray & Davis factory on the banks of the Charles river was planned.

This modern plant is 380 feet long, 60 feet wide, five stories high. It contains over 3 acres of manufacturing space, which is entirely devoted to electrical equipment. In fact, it is one of the largest factories of its kind in the world.

Will Acquire Still More Room

In the Amesbury plant, Gray & Davis employ 422 men. In the Boston plant over 1,000 operatives are employed. There are eleven departments and eleven department heads, aside from the president, vice-president and general manager.

During the past six months the firm has produced a starting-lighting system for Ford cars, and confidently expects to build over 100,000 of these systems during the next 12 months. This in addition to the 100,000 standard systems annually produced will tax the factory to the utmost, and it is expected that a new plant will be constructed before very long.

CONNECTICUT GROWS FROM 'PHONE START

Connecticut Automatic Battery System on 100,000 Cars for 1915

The Connecticut Telephone & Electric Co., Meriden, was started in 1894 by E. C. Wilcox and B. L. Lawton as a partnership with the object in view of manufacturing telephones and telephone apparatus, the basic telephone patents having expired a short time previous. In 1903 the business had grown to such an extent that it was deemed advisable to form a corporation in order to handle it to better advantage.

About 1903 the present factory building was purchased, but the growth of the business was so rapid that it has been necessary since that time to build two modern additions of brick construction. In 1906 the Connecticut spark coil was first announced and it proved so efficient and satisfactory that in 1909 practically 50 per cent of all the cars using coils had adopted this as standard equipment. On account of the advent of the magneto, however, the demand for vibrating type spark coils is practically eliminated.

Designed Special Ignition System

Early in 1912, knowing that the advent of car lighting would require a permanent source of current on the car, it was realized that there was an opportunity for a better system of ignition than that furnished by the magneto, and work was commenced on the perfection of such a system, the Connecticut automatic ignition system being the culmination. The advantages of this system over other forms of ignition have made it most popular, resulting in its adoption as standard equipment for more than 100,000 1915 cars.

In addition to the ignition outfits manufactured, master vibrators, lighting switches and controls in the various appliances necessary in the installation of a lighting system, are manufactured, and as a matter of fact over 400,000 1915 cars will carry electrical devices manufactured by this company.

While over 25,000 telephones are manufactured each year, nevertheless this is

only about one-tenth of the total business, the balance, or 90 per cent, being devoted exclusively to appliances for motor cars and motor boats.

NEW DEPARTURE CO. HAS HUGE GROWTH

**Started With 6 Employees; Payroll Now
Carries Over 2,000**

Twenty-five years ago the New Departure Mfg. Co., Bristol, started operations in one room with some of the present executives working at the bench and with barely a handful of employees. Now, however, more than 2,000 skilled mechanics are employed and the equipment of machinery, tools, buildings, etc., represent an investment of several millions of dollars. The floor space of the plants in Bristol, East Bristol and the Hartford division at Elmwood totals nearly 14 acres.

The New Departure company was organized June 27, 1889, as the New Departure Bell Co., and incorporated with a capital stock of \$50,000 to manufacture door, office and call bells. The bells produced were distinctly different from anything else of their kind and on their mechanism the company built up its name and its business.

Work was started in a small room at the north end of the old Thompson clock shop on Federal street, Bristol, with not more than six persons on the payroll. After a time, however, a line of bicycle bells was developed, and so rapidly did the business increase that the building known as the Jones factory was purchased. The company moved into this building about one year after it was established and for a time occupied but one floor. Meanwhile, New Departure bells were being sold all over the country, the output of the factory at one time being 10,000 bells a day.

Biggest Maker of Automatic Bells

A little later the company manufactured the Lucas bicycle lamp, but the business was subsequently sold to the firm of Joseph Lucas & Sons Co., in Birmingham, England. Some 16 years ago, the company originated and marketed the New Departure coaster brake for bicycles.

In February, 1907, the company purchased the business and plant of the Liberty Bell Co., at East Bristol. The entire bell department, including a line of fire and car bells, was straightway removed to the purchased plant. This company is the largest manufacturer of automatic bells in the world, it is claimed.

A little previous to this time the company began an extensive investigation into the manufacture of ball bearings,

the use of which was rapidly growing in this country, particularly in motor cars. Practically all ball bearings then were made abroad. This investigation was exhaustively conducted for several years and resulted in the equipment of a modern plant for the manufacture of the New Departure ball bearing. The first type developed was the double row, or combined radial and thrust bearing, which was entirely new. Later, other types of ball bearings were added to the New Departure line.

This year the company removed its offices to the new administration building, located adjacent to the plant in Bristol. The building is 62 feet wide and 215 feet long, five stories high, and fire-proof. The present officers of the company are: Albert F. Rockwell, president; Frank P. Furlong, vice-president; DeWitt Page, secretary and general manager; and Charles T. Treadway, treasurer. These men, with Charles F. Pope, of New York, and E. R. Burwell, of Bristol, constitute the board of directors.

VEEDER STARTED IN EARLY MOTOR DAYS

**Began Designing Distance Recording
Instruments Back in 1901**

In the early days of the automobile, that is about 1901, Mr. Veeder became interested in the new machines and realized the necessity for an accurate appliance for indicating the speed. A number of devices of this kind were considered which involved the use of a centrifugal governor principle and the principle of a magnetic drag, but a centrifugal pump forcing a liquid up in an indicator tube seemed to be the simplest and most reliable arrangement, and after a large number of experiments the Veeder tachometers for automobiles and mechanical purposes were developed by the Veeder Mfg. Co., Hartford.

300 Men in Veeder Factory

These instruments have become recognized in scientific laboratories and large manufacturing concerns as standard speed indicating devices.

A large part of the present business of the company is the manufacture of counters for use on various machines and odometers for measuring distance traveled by automobiles.

Making cyclometers, odometers, tachometers, tachodometers, counters, speed counters and castings, the Veeder Mfg. Co. now employs from 250 to 300 men when running full time. The company was organized in August, 1895, employing only 25 men. In 1897 it erected a factory on Sargeant street, a three-story and basement affair 110 feet in length

and 30 feet in width. Since then it has doubled its factory floor space and added a three-story and basement office building.

INDUSTRY OWES MUCH TO BROWN & SHARPE

**Old Concern Pioneer in Accurate Gear-
ing and Precision Tools**

At the time of the great "boom" in the bicycle business, towards the close of the last century, it was found that many of the machines, measuring tools, cutters, etc., regularly made by the Brown & Sharpe Mfg. Co., were adapted to the production of bicycle parts on a manufacturing basis, and a large business was done in the supplying of such equipment to the bicycle factories. New England machinery manufacturers secured a large share of this business, and the cities of Providence, Worcester and Hartford were prominent in supplying the required equipment. In 1897 a special catalog was issued by the Brown & Sharpe Mfg. Co., showing the machines and tools especially adapted for the use of bicycle manufacturers.

In many ways the automobile industry was a natural outgrowth of the bicycle business, and many of the same lines of machines and tools proved adapted to automobile manufacture. In addition, a great many new problems arose, which were met by new designs and extensive additions to lines of tools especially adaptable to automobile manufacture. Here, again, New England stood out prominently, and even though much of the automobile manufacture was established farther West, New England took and still is taking a leading part in the equipment and supplying the needs of these factories.

Authorities on Worm Gearing

In addition to this, the manufacture of transmission cases, and especially the gears for them, had its pioneer work done in the East, and the Brown & Sharpe Mfg. Co. was identified from the first with the production of high-grade gearing and paved the way for much that has been done in perfecting this important part of the mechanism.

A large business is still being done by this company in cutting gears for high-grade automobiles, and also in producing machinery for use in connection with them. This has included an investigation of the efficiency of worm gearing for automobile transmissions, made at the works of this company, under the direction of their engineers, and presented in a paper before the American Society of Mechanical Engineers, in 1912, by Prof. William H. Kenerson, of Brown University; so that Brown & Sharpe have

become authorities on such forms of gearing for transmissions and do an extensive business in this line.

The question of the use of modern steels and their proper heat treatment was another feature with which this company has been constantly identified, and their hardening and annealing furnaces have been extensively used in connection with this line of work.

Large Variety of Products

The use of grinding machines, both regular and special, such as those adapted for grinding cam shafts, has also been a factor in producing high-grade work on a manufacturing basis. The milling gear cutting and screw machines of this company are found in large numbers in the leading automobile factories of the country.

Castings of High Grade

In the making of high-grade castings pioneer work was also done by this company. Standard measuring tools, such as are regularly listed in the Brown & Sharpe Mfg. Co. catalog, are used today throughout the automobile industry, besides special tools, made by them particularly for the purpose. Such tools are largely supplied from New England, as well as lines of cutters, including gear cutters, formed cutters, etc., which are vital to the production of really good work.

Strong Influence On Car Building

The fact that the Brown & Sharpe Mfg. Co. has been vitally connected with the development of the automobile industry since its inception, having been pioneers in many lines of manufacture vital to the success of that industry, and

their machinery and tools being used so extensively in connection therewith, indicates the important position at least one New England concern has occupied in the development of this industry; and the fact that there are many other New England concerns which have also had a large influence would seem to show that New England cannot be overlooked, either for its past record or for what it is now doing for this vast and growing industry.

Even though it may be true that the motor car industry is largely carried on outside of New England, it is nevertheless true that a large part of the equipment of the shops, the methods used, and other factors, uniting to bring about the success of that industry, can be credited to New England.

WALLACE BARNES CO. ORGANIZED IN 1857

Product Now Reckoned in Millions and
Includes Screw Machine Parts

Springs form a very important part of the modern motor car, and no inconsiderable number of the springs upon which such great reliance is placed come from the plant of the Wallace Barnes Co., Bristol, Conn. This great industry was started in 1857, the original intention being the production of flat springs only.

This department has grown so in proportions, however, that the yearly production runs up to many millions of parts of all types, including flat springs, stampings, spring washers, etc. In addition to flat springs, the company also

produces coil and other springs of nearly every type, many of them being made by machinery that is entirely automatic in operation. Any spring or part made from spring steel, brass, bronze or German silver wire comes within the scope of the company's wire spring department. In addition, great quantities of small screw machine made parts are produced.

RAYBESTOS LINING SUCCESS FROM START

Royal Equipment Co. Began by Making
Leather and Canvas Linings

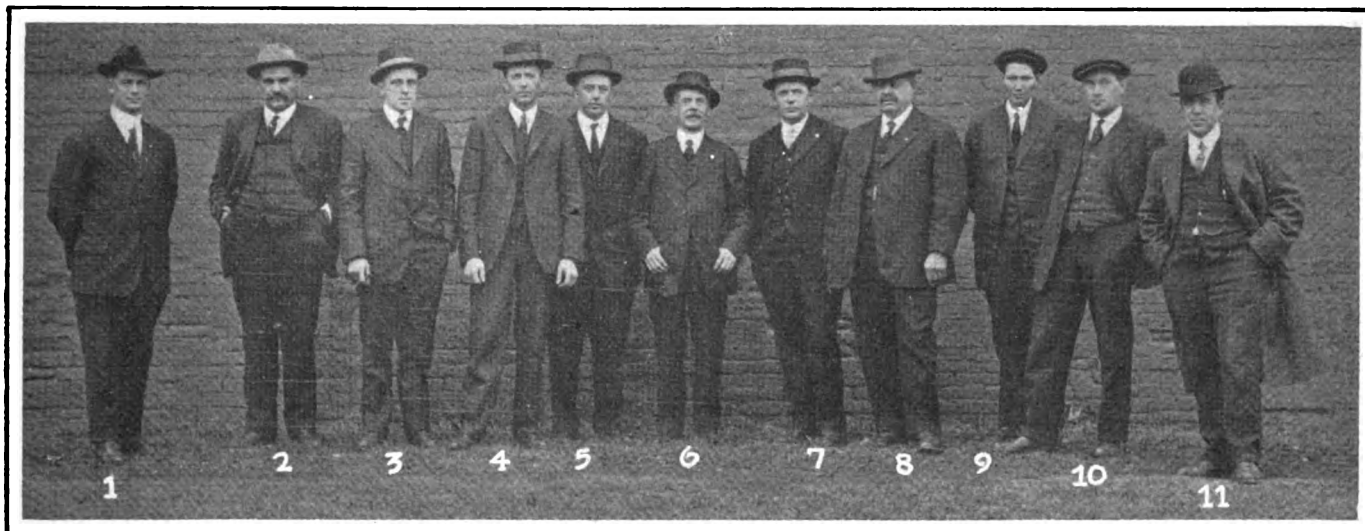
The Royal Equipment Co. started in business in 1901 and was incorporated in 1909. It first started manufacturing brakes in 1901. In 1905 it first brought out an asbestos brake lining and in 1906 trade-marked it Raybestos.

It is fairly well known that the first brakes used on automobiles were not lined, but were metal to metal. As these did not prove satisfactory, various kinds of materials were tried as linings, principally leather and canvas. Leather did not prove satisfactory but the canvas or cotton belt often lasted for considerable time.

Hit on Idea of Asbestos and Wire

After various experiments, always with a view to produce a satisfactory brake lining, the idea of using asbestos yarn with a wire core woven to the exact size desired and treated with a heat and wear resisting compound was conceived. From the start, asbestos brake lining was a success.

Garage Owner's Association of Woodford County, Ill.



(1) Edward Conrad, Eureka; (2) H. S. Van Horn, Wenona; (3) H. T. Parrett, secretary and treasurer of Garage Owners' Ass'n of Woodford Co., Wenona; (4) J. E. Unsicker, president of Garage Owners' Ass'n of Woodford Co., Eureka; (5) E. R. Gray, Minonk; (6) W. B. Taylor, president of Illinois Garage Owners' Ass'n, and of Motor Car Dealers' Ass'n of Rockford; (7) W. W. Ingram, Rutland; (8) Mr. Donner, El Paso; (9) B. Besther, Eureka; (10) T. Boyd, El Paso; (11) A. Marvin, El Paso

DEALERS, GARAGES AND REPAIR-SHOPS IN NEW ENGLAND

State	1912	1913	1914	Gain or Loss
Connecticut	409	416	507	+ 98
Maine	98	202	300	+ 202
Massachusetts	952	978	1,233	+ 281
New Hampshire	141	150	230	+ 89
Rhode Island	142	148	203	+ 61
Vermont	103	101	98	- 5
Total	1,845	1,995	2,571	726

New England Has 2,571 Dealers

Dealers, Garages and Repairshops Increase by 726 During the Past Three Years

THE past three years have been prosperous ones for New England dealers, if the increase in their numbers is any indication. At the end of 1914 there were 2,571 dealers, including garagemen, car distributors and accessory stores, as against 1,995 in 1913, and 1,845 in 1912. This represents a gain of nearly 600 during the year 1914.

During the same period, New England registration jumped 48,063; from 94,434 in 1912, to 117,403 in 1913, and 142,497 in 1914, giving a car to dealer ratio for the three years of 51, 59 and 55, respectively, so that it is seen that notwithstanding the increase in the number of dealers in the past three years there is more business for them now than there was then.

Almost Two Cars Per Hundred

Today there is an average of 52 inhabitants in this territory to every car, estimating the population at 7,540,000, while in 1912 there were 69 people per car, estimating the population at 6,570,000. The number of cars is comparatively large when it is considered that the area is only 66,424 miles, or smaller than many states.

Taking each of the six states separately, the number of dealers in Maine increased 200 per cent from 1912 to 1914. In 1912 there were 98 dealers and in 1913 the figures grew to 202, and last year to 300.

New Hampshire had 141 automobile business places listed in 1912, 150 in 1913 and 230 last year, gaining 89 in the three years.

Rhode Island figures were 142, 148 and

203 for the three years, a gain of 51 altogether.

Massachusetts trade showed steady growth, 952, 978 and 1,233 being the figures for the three years.

Connecticut had 409, 416 and 507, only a slight gain but nevertheless an advance.

Vermont is the only state that has lost,

THERE ARE 33,515 CARS IN 30 MASSACHUSETTS CITIES

City	Cars	City	Cars	City	Cars
Boston	7,950	Cambridge	785	Everett	455
Worcester	2,955	Malden	765	Chicopee	425
Springfield	2,840	Quincy	740	Melrose	425
Newton	1,730	Lawrence	670	Gloucester	395
Lynn	1,425	Holyoke	655	Northampton	340
New Bedford	1,260	Salem	620	Chelsea	290
Lowell	1,180	Waltham	620	North Adams	235
Somerville	1,175	Pittsfield	600	Woburn	225
Fall River	1,130	Fitchburg	530		
Brockton	1,105	Medford	525		
Haverhill	1,010	Beverly	455	Total	33,515

there being now five less traders than there were in 1912. The figures for 1912, 1913 and 1914 are 103, 101 and 98, respectively.

20-30 Horsepower Popular

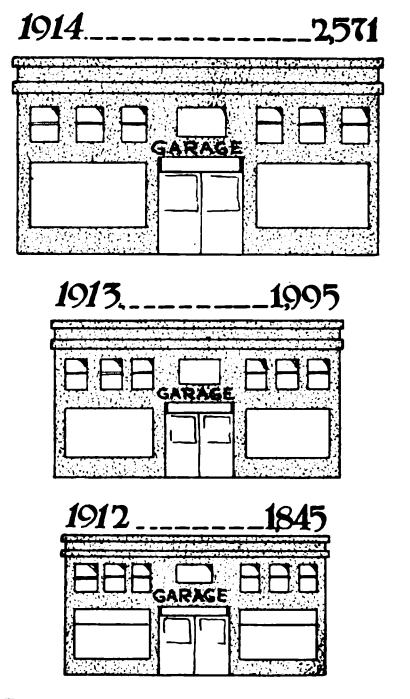
The registration figures for Massachusetts show that cars between 20 and 30 horsepower are still the favorite. In 1913 there were 12,731 of 20 horsepower and under, and the 1914 figures showed 16,911. The 20 to 30 horsepower class had 29,390 two years ago and 35,806 last year. The 30 to 40 class had 9,145 and 10,848 and the 40-50 class 4,832 and 5,733, respectively. The 50 and over had 620 in 1913 and 635 in 1914. These figures do not include re-registration at half prices:

It was possible to get the figures in Massachusetts for the past six years relative to dealers, chauffeurs, private operators, etc., from the highway commission. They show a steady increase year after year, as the accompanying tables indicate.

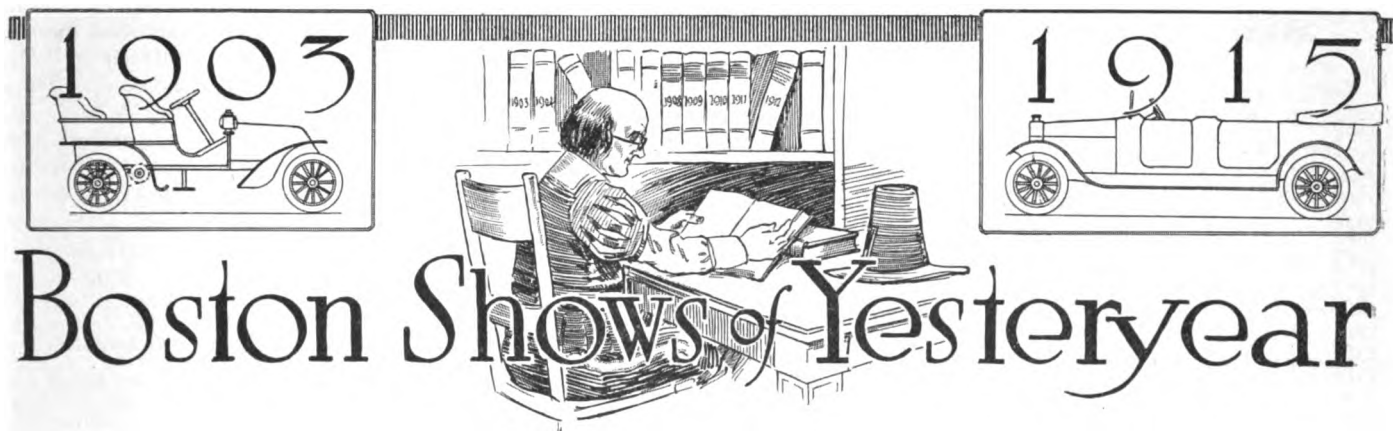
The individual registration figures are interesting and instructive: Maine, with 800,000 people, has increased its registration from 7,743 to 14,240; New Hampshire, with 463,000 people, from 5,764 to 8,040; Vermont, with 370,000 population, from 4,300 to 7,613; Massachusetts, with 4,042,000, from 51,229 to 78,350; Rhode Island, with 600,000 people, from 7,565 to 12,331; Connecticut, with 1,265,000 persons, from 17,950 to 12,331.

COMPARISON OF MOTOR CARS AND POPULATION BY STATES

	Approximate Population		Ratio of Automobiles to Population		No. of Cars Allowing for Duplicate Registration			Gain in No. Cars Since 1912
	1912	1914	1912	1914	1912	1913	1914	
Connecticut	1,115,000	1,265,000	1 to 62	1 to 57	17,950	23,263	21,923	3,973
Maine	750,000	800,000	1 to 97	1 to 56	7,743	10,570	14,240	6,497
Massachusetts	3,366,000	4,042,000	1 to 66	1 to 51	51,229	60,826	78,350	27,121
New Hampshire	440,000	463,000	1 to 76	1 to 57	5,764	7,420	8,040	2,276
Rhode Island	543,000	600,000	1 to 72	1 to 49	7,565	9,894	12,331	4,766
Vermont	356,000	370,000	1 to 82	1 to 48	4,183	5,430	7,613	3,430
	6,570,000	7,540,000	1 to 69	1 to 52	94,434	117,403	142,497	48,063



The relative number of dealers, garages and repair-shops in the New England territory during the years 1912, 1913 and 1914. In 1912 there were 1,845 as against 2,571 in 1914, an increase of 726



Forgotten Facts Culled From Contemporaneous Files

Names That Have Lived Through All Boston's Thirteen Shows

Milestones in the History of an Institution Grown From a "Demonstration"

—Steady Progress Has Boosted Exhibits From 50 to Six Times That Number

IT IS a far cry from Boston's Thirteenth Annual Show, which opened Saturday afternoon last, back through the intervening years to the event which marked the beginning of New England shows. And what a rattling of old dry bones accompanies a rustling of the leaves of dusty tomes which chronicled those early forerunners of our modern automobile shows.

The fact that this is the thirteenth annual show makes plain that the first was held as long ago as 1903, when motor cars, as such, were more or less held up to ridicule and "no one believed the boom would last." But even before 1903 those who were directing the destiny of the automobile had contemplated holding a show. The project was first voiced in 1901, but it did not receive a very hearty support, as witness the sentiment as reported in *Motor World* early in that year:

Dealers Feared Competition

"The dealers now established in Boston are opposed to the holding of a show [in 1902] which would bring in a large assortment of vehicles at present unfamiliar to their district."

As a result of this feeling, so strangely in contrast to the spirit of modern merchandising, the whole idea of a show was abandoned, and it was not until two years later that it was again brought up. In the meantime, cars had been perfected to a greater extent, public confidence in the vehicles had increased, and many of the dealers who are now doing business along Boston's automobile row had become firmly established.

So that when the subject was again broached dealers were in a more receptive frame of mind.

But Boston's first show was not a show at all, strictly speaking. This was held February 24-28, 1903, and was principally a demonstration, which makes plain that the public, though in part educated to the possibilities of self-propelled vehicles, was still in need of convincing argument. The nature of this first show, as it was called, held under the auspices of the New England Automobile Association in Symphony Hall, is well brought out by the following report which appeared in *The Automobile* for March 14, 1903:

Show a Demonstration

"... by the time the end of the show week approached, each afternoon and evening was filled with stunts and tricks by autos and varied with acrobatic feats, bicycle riding and trained dogs in such a manner that there was scarcely a dull moment. The show was really an exhibition of expert operation of motor carriages and as such it had no equal perhaps in any indoor affair of this sort since autos came into popularity."

In this show the cars were staged under the balconies, with the arena left free for demonstrations. Among other things there was a grade of 26 per cent, up which some of the cars were driven. Continuing, *The Automobile* says:

"As a rule, the program for each afternoon consisted of a parade, a half hour of promiscuous running, a coat and vest race, a pin race, a slow race, an obstacle race, a performance by E. Doane on a tight rope stretched on an Olds moving slowly around the hall. . . . An orchestra gave concerts, also. . . . One

other attraction was a quadrille with light autos performed while the floor was otherwise clear."

The show committee consisted of Col. Elliott C. Lee, of Brookline; Frederick Tudor, of Boston, and Dr. W. A. Rolfe, of Boston, acting with Col. James T. Soutter, president of the New England Automobile Association and the Massachusetts Automobile Club, and Dr. F. L. D. Rust, the club's secretary.

"Vehicles actually exhibited at the show," says *The Automobile*, "were two Buffums, loaned by Dr. W. S. Shrigley and Dr. W. A. Rolfe; a Renault, loaned by H. B. Corey; a Georges-Richard, loaned by Royal R. Sheldon; two Wintons; a canopy top Robinson touring car, a Robinson without top, one American, three Packards, six Oldsmobiles, including an opera phaeton; one Fournier-Searchmont, two Autocars, three Knoxmobiles, one Duryea, one Stevens-Duryea, one Pierce Motorette, one country club car, one Crestmobile, one Elmore, one U. S. Long Distance, one Automotor, two Decauvilles, two Clement cars, with a Clement chassis and a four-cylinder Clement motorcycle, a Waverley electric, a Columbia surrey electric, two Mobiles, two Stanley steamers, a White runabout and a White delivery wagon and three Marsh motorcycles."

Dealers First Show in 1903

It was just one month later that what may be viewed as the first Boston show was staged by the Boston Automobile Dealers Association. This was held during the week of March 21, and, like its predecessor, was housed in Symphony Hall. Says *The Automobile* of March 28, 1903, in its review of the affair:

"Not a commercial vehicle was shown. Except for the electrics, which included broughams and coupes, everything on view was of the runabout, surrey or touring car pattern, but every carriage was of the 1903 model. Parts exhibited

STATISTICAL STORY OF BOSTON SHOW'S GROWTH

Year	Gasoline Cars	Electric Cars	Steam Cars	Commercial Vehicles	Accessories	Total
1903	26	3	6	1	14	50
1904	..	..	..	..	..	..
1905	47	3	6	0	98	154
1906	61	5	5	5	95	171
1907	69	10	4	4	141	228
1908	72	2	2	1	160	237
1909	64	5	3	4	156	232
1910	52	7	1	21	184	265
1911	78	3	2	34	173	290
1912	79	6	1	47*	194	327
1913	68	6	1	47*	264	386
1914	76	5	1	31*	181	294
1915	66	4	1	34	148	253

* Exhibited separately second week.

were few, but there were several good displays of clothing and accessories.

"No moving carriages were shown," continues The Automobile, "but agents had duplicate cars on the avenue outside and spent much time each afternoon giving demonstrations to prospective purchasers. Police traps on the streets around Symphony Hall early began to interfere with the great game of demonstration, in which . . . upward of 25 autos took part."

Dealers' Show Made Money

"The best exhibit of any, from the point of view of the promoters, was the box office, for whereas the other Boston Automobile Show this year dropped \$1,500 for the New England Automobile Association, this show of the Boston Automobile Dealers' Association cleaned up fully \$6,000 besides doing a business measured in sales of cars of probably \$200,000 at the least."

"An interesting affair of Wednesday was the dinner party given to newspapermen at Auburn-dale . . . by Harry Fosdick, the eastern manager for the Winton company."

This first Boston show also marked the beginning of the long succession of annual dinners held by the Boston Automobile Dealers Association, the first one being held in the Hotel Lenox on the night of March 20. Nearly 80 dealers, manufacturers and enthusiasts attended, we are told, a complete list of those present being as follows:

Many Familiar Names

E. W. Pope, J. C. Robinson, F. E. Randall, G. G. Reed, A. P. Underhill, F. J. Read, R. F. Kelsey, A. Skinner, H. B. Shattuck, F. E. Stanley, Sam Shuman, Edwin L. Smith, Mortimer F. Smith, F. G. Saylor, J. S. Pratt, W. E. Upton, Charles E. Whitten, Lieutenant Ames, J. J. Donovan, J. C. Kerrison, Charles J. Glidden, F. H. Tudor, H. L. Lodge, T. W. Goodridge, E. N. Goss, J. J. Coakley, W. E. Eldredge, W. I. Wilson, J. E. MacIntosh, Ralph Lewis, H. L. Davis, L. Van Steenburg, F. A. LaRoche, E. H. Corson, D. E. Smith, W. and C. Bates, B. F. Blaney, Mr. Bean, Edward M. Bliss, H. H. Buffum, A. R. Bangs, J. C. Crompton, Ross Drisko, Bert Snow, W. E. Helfer, Fred Hunt, A. T. White, Alvan T. Fuller, Harry Fosdick, W. H. Field, William Gray, George Corbin, George H. Lowe, Winsor T. White, Mr. Stearns, H. E. Marvel, J. Snow, J. H. MacAlman, C. C. Hilderbrand, E. R. Thomas, F. M. Hoblitt, J. L. Poole, A. E. Hughes, W. E. Hurlburt, W. E. Metzger, Walter Sterns, A. T. Robey, B. F. Dingley, J. S. Pratt, Fred O'Connell, J. H. Davis, Louis Smith, W. H. Kirkpatrick, E. B. Olmstead, W. I. Relf, O. L. Stevens, F. F. Weston, G. H. Kimball, W. E. Hadley.

So popular was the 1903 show and so greatly had the industry grown in the

interim, that in 1904 the Boston Automobile Dealers Association opened two shows simultaneously, one in Symphony Hall and the other in Horticultural Hall, with a single ticket admitting to both.

"In Symphony Hall," says The Automobile of March 26, 1904, "were shown 84 cars and 11 chassis, besides half a dozen motorcycles. Horticultural Hall contained 35 cars, 5 chassis, 10 motorcycles, 7 motor launches and numerous exhibits of accessories, including automobile robes and clothing."

Even at this early date the increasing size of the show made necessary a search for a larger building, and in the same issue of The Automobile we read that "there was considerable sentiment in the meetings of the dealers' association toward taking the shows down to Mechanics' Hall. . . ."

Good Display in 1904

In reviewing the show, The Automobile says:

"Nearby, the Crestmobile group of R. F. Colburn was one of the few in the show to include a surrey with the more numerous tonneaus, while just across the aisle the Knox exhibit of the Reed-Underhill Co. was distinguished by a handsome chassis mounted on a plate mirror . . . and kept in action by an auxiliary electric connection. . . . A. R. Bangs, who has just moved from the midst of Boston's automobile row to a roomy and well-fitted garage on Brimmer street . . . made a handsome showing of Franklin four-cylinder cars . . . near him on the same side of the hall was E. A. Gilmore's exhibit of Rambler cars . . . among the more showy exhibits were those of the Pope Mfg. Co. and Kenneth A. Skinner. . . . Mr. Skinner has added to his popular line of DeDion Bouton cars, for which he is the sole United States agent, a heavier French car known as the Boyer. . . . In the Locomobile exhibit by J. H. MacAlman was a handsomely finished 24-horsepower gasoline touring car. . . . Fred A. Randall added to his line of Clement Bayard and Stevens-Duryea cars the Stevens-Duryea racer . . . the Packard Gray Wolf was shown among a good display of Packards, Orient buckboards and Northern runabouts by Alvan T. Fuller."

Statistics of this second show follow: Gasoline cars, 95; steam, 13; electric, 11; motor bicycles, 14; foreign cars, 10; chassis for steam vehicle, 1; chassis for gasoline cars, 15.

By the time another year had left its

impress on the sands of time, the Boston show had become an established fixture, and in Motor World of March 16, 1905, we read that the 1915 show was "quite the greatest ever held outside the confines of Madison Square Garden, New York." This show marked the entry of the function into Mechanics' Hall, where it has remained ever since. Just how popular the event proved may be estimated from the following extract of the Motor World report:

Police to Handle Crowd

"It was only today when it was announced that the official count showed 47,500 admissions, that a true idea of the immensity of Saturday's gathering was obtained; it was also made known today that so crowded was the building that the police had to put up the bars and refuse to admit the late comers, of whom it is stated there were several hundreds, if not thousands."

What visions a list of the exhibitors in these old shows bring up! And how prophetic were some of the products that were displayed to somewhat incredulous gaze. There was at this show, for example, the Gasaulec, produced by the Vaughn Machine Co., of Peabody, Mass., a gasoline-driven car with a magnetic transmission system and magnetically-operated valves; incidentally, the electric mechanism was also engine starter and generator in one. Another historical old timer was the Ariel, produced by the Ariel Motor Car Co., of Boston, and which was so arranged that it might be cooled by either air or water.

The names which are today familiar in Boston even then were gaining prominence, for among the exhibitors were such dealers as J. H. MacAlman, who had the Locomobile; Alvan T. Fuller, who at that time handled not only the Packard but the Cadillac and the old Northern as well; Harry Fosdick, Winton; the Reed-Underhill Co., Knox and Stearns; Dowling & Maguire, Pierce; C. S. Henshaw, Thomas, etc.

At this show there were 2 exhibits of electric cars, 47 of gasoline cars, 8 of steam cars and 99 of accessories.

1906 Show Big Success

The show which was staged in 1906 was no less popular than that the previous year, and learning by its experience the show committee took tickets at all doors. In its review of the show, Motor World for March 15, 1906, says:

"Familiar names and cars greeted the eye on every side . . . The entire left-hand side of the main aisle leading from the entrance to Mechanics' Hall was flanked by the Columbia gasoline and electric machines [Columbia Motor Vehicle Co.], the Locomobile [Locomobile Co. of America], the Fiat, the Studebaker [Harry Fosdick Co.] and Ramblers [T. B. Jeffery & Co.]. On the right facing this line were the Reo and National [Linscott Motor Co.], Marion and Ranier [Morrison-Tyler Motor Car Co.]. Next to them was to have been installed a newcomer, the Essex steamer, but the space was abandoned and given over to the display of the Lambert Friction Drive cars [Buckeye Mfg. Co.]. Among the principal occupants of the main floor of the grand hall were the White steamers

[White Sewing Machine Co.], the various makes of Pope vehicles [Pope Mfg. Co.], the Packard and Cadillac [Alvan T. Fuller], Pierce Great Arrow [J. W. Maguire Co.], Royal Tourist [George J. Dunham], Winton [Winton Motor Carriage Co.], Autocar [Moore & Smith], Crawford [Boston Automobile Exchange], and American Mercedes [Mercedes Import Co.].

Annex Required This Year

"The overflow exhibit was housed in Symphony Hall, a block or so distant, and was devoted principally to foreign cars, including several American makes, such as the Shawmut [Shawmut Motor Co.], which made its first appearance; the Queen line [Blomstrom Motor Co.], the Northern line [Northern Automobile Agency], the Iroquois cars [Iroquois Motor Car Co.], the Glide [Crown Motor Co.], and the Stanley steamers [Stanley Motor Car Co.].

"Among the accessories were such well-known names as Chas. E. Miller, Post & Lester, Veeder Mfg. Co., Gray & Davis, Hartford Suspension Co., Whitney Mfg. Co., the Albert Champion Co., which exhibited the Nieuport low tension and the Gianoli high tension magneto, Bowser, Witherbee, Jones speedometer, J. H. Sager Co., Gilbert & Barker.

"Motor boats formed no small part of the show; they, however, were relegated to the basement.

The advent of the 1907 show, which contained a total of 282 exhibitors, marked the first serious attempt at decorations and may be looked upon as the forerunner of the present day spectacles in Mechanics' Hall. For the decorative scheme an apple orchard was chosen and though there may seem no connection between this and motor cars the effect was nevertheless pleasing. Also, there was a ladies orchestra, decked out all in white, and, we read in Motor World for March 14, 1907:

"In Horticultural Hall smaller offshoots of the same ladies' orchestra play and play, while in the basement the 'Honnalula Students,' a sextette of dusky, squeaky vocalists and strummers, gather in a motor boat and sing and strum to a toy machine shop opposite.

Many Exhibitors in 1907

Continuing, Motor World says: "Ranged along the central line in this heart of hearts of the show are the stands of the Autocar [Fred S. Smith], Cadillac, Packard [Alvan T. Fuller], Crawford [Boston Automobile Exchange], White [White Sewing Machine Co.], and Winton [Winton Motor Carriage Co.], while up on the stage are the Cleveland and Pierce-Racine [Butler Motor Car Co.] and the Stanley steam cars [Stanley Motor Carriage Co.], the American Mercedes and De Luxe [H. C. Stratton & Co.] occupying prominent position on the right and left extensions, which are barely large enough to hold them. Upon the left run signs which read American Mors, Mitchell [W. M. Jenkins & Co.], Studebaker [Prentiss Motor Car Co.], Aerocar [George H. Lowe & Co.], Matheson [Matheson Motor Car Co.], Welch and Springfield [The Mills-Kennedy Co.], Royal [Royal Auto Co.], and Stevens [Frederick E. Randall], and on the opposite side, on either side of the third aisle, are Knox [Reed-Underhill Co.], Corbin [E. T. Kimball Co.], Grout [Grout Bros. Auto Co.], Babcock [Babcock Electric Carriage Co.], Pierce [J. W. Maguire Co.], Berliet [Park Square Auto Station], Stoddard-Dayton [C. F. Whitney], and Mora [H. E. Whiting]. In the balcony are several cars, at the extreme left being the new Bailey electric [S. R. Bailey & Co.], Amesbury's latest product, and the Rauch & Lange electric [Rauch & Lange Carriage Co.].

Not the least startling of the novelties

which this show developed was the Heyman, which was chiefly remarkable by reason of the fact that it had a motor which was catalogued as being of the "magazine type." Investigation revealed this to be a five-cylinder rotary motor completely enclosed. Among the other newcomers were the Springfield, exhibited by the Med-Bow Co., of Springfield, and the Gearless car, which was not altogether gearless despite its name.

The accessory list at this show was considerably longer, and in addition to makers who were at previous shows included such well-known names as Byrnes-Kingston & Co., F. S. Carr, Connecticut Telephone & Electric Co., Gould Storage Battery Co., Hyatt Roller Bearing Co., Hoffecker Speed & Mile Indicator Co., Leather Tire Goods Co., Prestolite Co., Rose Mfg. Co., and C. F. Splittdorf.

The 1908 show was staged in what was called a Japanese Garden and not even the ladies' orchestra—the leader this year garbed in brilliant red, however—was missing. Said Motor World of March 12, 1908:

Some New Names in 1908

"Practically all of the well-known makers were represented. Such well-known names as White [The White Co.], Winton [Winton Motor Carriage Co.], Northern [Northern Motor Car Co.], Great Arrow [J. H. Maguire Co.], Royal [George J. Dunham] and Corbin are prominently displayed in Grand Hall, as are those of Stoddard-Dayton and Berliet [Park Square Auto Station], Apperson [Fred S. Smith], Stevens-Duryea [J. W. Bowman Co.] and Stearns [Morgan B. Kent], Mitchell [W. M. Jenkins & Co.], Pope [Dodge Motor Vehicle Co.] and Elmore [F. R. Parker & Co.] are hardly less prominent. In Exhibition Hall, and side by side, are the Marmon [F. E. Wing] and Franklin [Franklin Automobile Co.] exhibits, with Rambler [Thomas B. Jeffery & Co.], Cadillac, Packard [A. T. Fuller], Locomobile [Locomobile Co. of America], Thomas [Whitten-Gilmore Co.] and Matheson [Matheson Co. of Boston] close at hand. There, too, are the National and Reo [Linscott Motor Co.] and Ranier [Morrison-Price Co.], none the less prominent through being catalogued under dealers' names, while Oakland [Oakland Motor Car Co.] and Brush [South End Car Co.] go well in the same vicinity, flanked by Studebaker [Studebaker Bros. Co.], Premier [Premier Boston Depot] and Maxwell [Maxwell-Briscoe Boston Co.].

Locomobile and Studebaker Novelties

At this show both Locomobile and Studebaker uncovered new creations, the former being what was styled a "40 run-about," a low-hung affair, and the latter a "Suburban roadster," which might be on occasion a two-, three- or four-passenger car or a vehicle for carrying baggage. Even at this early date the Franklin company was emphasizing the light weight of its cars and by way of bringing home this point had one of its stock models mounted on platform scales.

As usual, the show revealed several novelties, prominent among which was the Blomstrom gyroscopic car, which was featured by a two-cylinder opposed motor with a vertical crankshaft and an exceptionally large flywheel, the face of

which was used as one member of a friction transmission. Other cars which came into being just prior to the show were the Crown special, the Brouhot and the Viking, none of which, needless to point out, have survived the intervening years. The Stillson Motor Car Co., which as long ago as 1908 had been making six-cylinder cars exclusively, made its first bow at this show, though little has been heard of it since.

"Exceeding all preconceived notions of a local show, revealing a greater number of cars than either of the two New York shows of this season, and bigger than any exhibition of its kind ever held in New England, . . ." says Motor World of March 11, 1909, in speaking of the 1909 show.

409 Automobiles in 1909

"In proof of the sheer bulk of the show, witness the fact that it revealed one-third more cars than were shown at the corresponding time a year ago, that there were half a hundred of as many cars on view as were shown at Chicago last month, and that it stages within 100 of as many cars as were shown at both the recent New York shows put together. As a matter of fact, 409 distinct and separate vehicles are displayed, this number representing the product of more than 100 different makers and the presentation of just 90 exhibitors. Of parts, accessories and equipment there are 150 displays." It was at this show that both the Velie and the Herreshof made their first bids for popular acclaim. The Velie appeared with a Herreshof motor, 4 x 4 inches, and the body carried five passengers.

"Another out of the ordinary feature," said the Motor World report in reviewing the Herreshof, "is the use of the progressive type of change gear."

The peculiarity which this year's Boston show developed—and each Boston show develops at least one—was a compressed-air-operated car in which the usual transmission system was replaced by an air compressor and an air motor. This car was the product of the Compressed Air Power Co., which long since has gone the way of all of the other novelties.

"Rather an unexpected feature of the show," continues the Motor World report, "is the strength exhibited in the section devoted to the display of commercial vehicles. . . . The absolute newcomer of the group is the A.L. Co., which displays a three-ton express wagon; another of the newcomers is the Frayer-Miller, which represents the first fruits of the renewed efforts of the Oscar Lear Automobile Co. Other displays which go to show the number of commercial vehicles on view are those of the General Vehicle, Gramm-Logan, Studebaker, American and Rapid companies."

Trucks Prominent in 1910

The show in 1910 was another apple orchard. There were 87 exhibits of cars and 197 accessories. Said Motor World of March 10, 1910:

"The display of commercial vehicles in the basement is an impressive one; it probably is the best representation of such cars that ever has been made and illustrated vividly the progress that has been made in the construction of the 'big fellows.' The total number of commercial vehicles and chassis displayed is 62, whereas the commercial vehicle section of the Chicago show

of 1907, the largest previous exhibit of its kind, mustered but 57 vehicles."

Among the trucks which were shown were the Rapid, by the Butler Motor Car Co.; the Couple Gear, by W. E. Eldridge; the Packard, by Alvan T. Fuller; the General Electric, by the General Electric Co.; the Randolph and Frayer-Miller, by D. P. Nichols & Co.; the Anderson and Chase, by N. S. H. Sanders; the Grabowsky, by the Stevens-Sowers Motor Car Co.; the Knox, by the Underhill Co., and the White, by the White Co.

1910 Brings Four New Cars

Among the new pleasure cars to put in a first appearance were the Warren Detroit, the Paterson, the Standard Six and the Johnson.

The accessories display was complete, as usual, and included Whitney, Brampton and Baldwin chains, all of the various lubricants, including Havoline, Harris, Monogram, Invader, Vacuum and others.

"Certainly," says the Motor World report, "no element of the accessory section is more prominent than the array set forth by the numerous manufacturers' agents, jobbers and retailers. For example, there is W. J. Connell, with Elite jacks, E. & J. lamps and W. & S. magnetos and carbureters; J. D. Coward, with Best Traction chains and Ajax windshields; W. S. Daniels, who handles the Kokomo ignition appliances, Globe tool and battery boxes and Kingston carbureters; Harry Eisner & Co., who displays Fry's spark plugs and Yankee whistles and mufflers; Post & Lester show the Roy lamps, Volier horns and Luna clock, among other things; Percy Ford Co. has, among other things, the Kennedy carbureter."

"No Boston Show would be complete, it must seem," says Motor World of March 9, 1911, in its report of the 1911 show, "unless White [White Co.], Alco [American Locomotive Co.], Stoddard-Dayton [United Motor Boston Co.], Winton [Winton Motor Carriage Co.], Pierce-Arrow [J. W. Maguire], Knox [Underhill Co.], Stevens-Duryea [J. W. Bowman Co.]." In addition to these there were the following well-known Boston names on the signs in Mechanics' Hall: Connell & McKone Co. (Overland), Curtiss-Hawkins Co. (Speedwell), Alvan T. Fuller (Packard), G. E. & H. J. Habich Co. (Havers), Linscott Motor Co. (Reo and Moon), J. H. Mac Alman (Columbia and Stearns), J. W. Maguire (Pierce-Arrow), Alfred Cutler, Morse & Co. (Renault and S. P. A.).

Factory Branches Spring Up

It was just about this time that the various factories commenced placing factory branches in Boston instead of leaving the distribution of their products in the hands of dealers; thus, many of the names which up to that time had become familiar, not only in Boston but throughout the whole of the surrounding territory, became but memories. In many cases the dealers whose names stood for the factory products still re-

mained with the factory branches, but their individuality was lost, at least in part.

Accessories on the Increase

The accessory display continued to grow, the total number at this memorable exposition being 173, and practically without exception all the names made familiar by previous shows were included in the list. Not all of these names live to the present day, though many of them have grown considerably in importance in the interim. Among these might be mentioned, for example, the Ajax Trunk & Sample Case Co., the American Ever Ready Co., Apple Electric Co., which but recently was absorbed by the Splittorf interests; Bosch Magneto Co., S. F. Bowser & Co., White & Bagley, Wayne Oil Tank & Pump Co., C. A. Shaler Co., Stromberg Motor Devices Co., Marburg Bros., Lovell-McConnell Mfg. Co., Findeisen & Kropf Mfg. Co., Gray & Davis, Heinze Electric Co., Champion Ignition Co., and a long list of others.

85 Commercial Vehicles

The commercial vehicle display lived up to the promise of the previous year and was of considerable importance, there being some 85 vehicles on view, of which five were electric.

The 1912 Boston show was marked, as were the previous New York and Chicago exhibitions, by a considerable outcropping of engine starters, a great many of the cars on view being equipped with them and no small number of starters being among the accessory exhibits. The scene of the show was laid in what Manager Campbell was pleased to term an English Estate.

In addition to being engine starter year this was also the Knight engine year, such new exponents of this principle as the Stearns, the Columbia, the Stoddard and the Atlas making their first public appearance in Boston. In addition, more or less of a furore was created by the appearance of Miss Margaret E. Knight's sliding sleeve valve motor. Despite the similarity in names, Miss Knight's motor proved quite a little different from Charles Y. Knight's invention, the former having sliding crescent shaped valves in contrast to the cylindrical sleeves employed in the latter.

First Two-week Exhibition

This edition of the Boston show was the first to be stretched out over two weeks; heretofore both pleasure cars and trucks were shown at once, but the exhibit by this time had grown to such proportions that it became absolutely necessary to split the show into two sections. Hence the first week was devoted to pleasure cars and the second to commercial vehicles, a large number of the accessory exhibitors remaining for both weeks of the show.

Some of the more prominent dealers who exhibited trucks were the Curtiss-Hawkins Co. (Speedwell), Alvin T. Fuller (Packard), Linscott Motor Co. (Reo), J. H. Mac Alman (Commer), Frank M. Phelps (Baker), R. L. & H. H. Smith (Boston), Whitten-Gilmore Co. (Dayton and Federal).

Miss Knight Shows Car

As was the case at so many previous Boston shows, the 1913 event was largely a doubling up of the previous New York and Chicago shows, though it revealed several cars not seen at either of these. The most striking was the K-D, which was built around the sliding Crescent valve motor with which Miss Margaret E. Knight entered the industry the previous year. This time, however, it was a six, the original motor being a four. Among the other cars on view the Moyer was the only six to make its initial appearance of the year.

Electrics, which had steadily been becoming of greater importance in the hub, this year blossomed out in full force, the display including such well-known makes as Waverley, Detroit, Rauch & Lang, Woods, Borland, Standard, Bailey, etc.

Only Pleasure Cars First Week

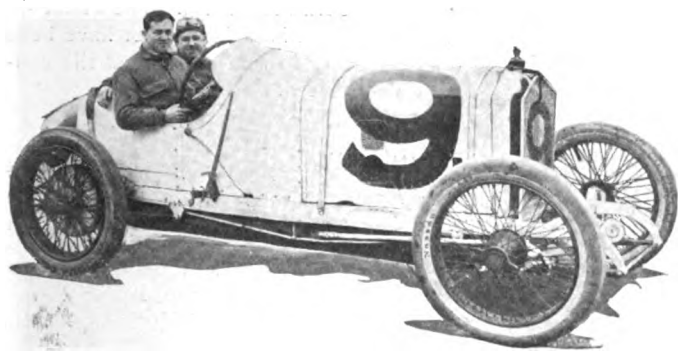
As was the case the previous year, only pleasure cars were shown during the first week, the trucks being given a week all to themselves. All told, there were 47 exhibitors of commercial vehicles.

The 1914 show may be justly termed—we quote from Motor World, March 12, 1914—the "biggest automobile dealers' show in the world." Although there were 82 different makes of cars on view at the New York show and 86 at the Chicago show, there were 90 in the Boston exhibit, and this four-score and ten exhibits held 260 cars and 27 chassis, including about a dozen electrics and the same number of cyclecars.

Boston—a Dealers' Show

Long before this the fact had become apparent to everyone within the industry, and a good proportion of those without it, that the Boston show is purely a dealers' show. It is a dealers' show not only because it is promoted by dealers, but because it is the greatest gathering center of the year for other dealers who are not exhibiting. From as far north as the northernmost point in Maine, where it stretches up into Quebec, and from the southernmost corner of Connecticut they come. The Boston show is a tremendous magnet for the dealers throughout the whole of the great New England territory; its drawing power insofar as dealers and distributors is concerned is far greater than that of either of the two national events, despite the fact that these are promoted by the manufacturers.

Resta and Wilcox Repeat in the Vanderbilt



Resta in the Peugeot with which he won both the Grand Prix and Vanderbilt Cup races

**Winner's Peugeot Averages Better Than
67 Miles an Hour—Wilcox in Stutz
Makes Magnificent Fight**

**Pullen Brings Mercer Third and De
Palma's Mercedes Is Fourth—Weather
Fine and Course Good**

San Francisco, Cal., March 8—Special Telegram—Resta, Wilcox; Resta, Wilcox—that is a good part of the story of the Grand Prize and Vanderbilt cup races. Driving the same Peugeot with which he won the Grand Prize, Resta romped away with the Vanderbilt on Saturday last at an average speed considerably better than in the first event. And Wilcox, at the wheel of a Stutz, was only 20 seconds further behind Resta in the Vanderbilt than he was in the Grand Prize. Resta flashed over the line in 4:27:37, which is at the rate of 67.3 miles an hour; and Wilcox slipped over in 4:34:36, exactly 6 minutes 59 seconds later, and traveling at the rate of 65.6 miles an hour.

The course over which the race was run was vastly different, insofar as its surface is concerned, from the course for the Grand Prize. For whereas the former was run in a pouring rainstorm which turned the event into a more or less glorious mudfest, the latter was run in all the really glorious sunshine for which the Pacific coast is justly famous. Actually, the course was the same, geographically speaking; the race went for 77 laps, which is 300.3 miles.

Resta Draws the Plaudits

Those who thought that Resta won because of a fluke and the withdrawal of many of the best drivers in the Grand Prize, are silent. Nothing but praise is now heard for the unassuming little driver who captured in his first appearance on American soil the most coveted trophies put up for motor car racing.

Pullen, the world's speed record holder, won third place, after having furnished for the spectators the greatest thrills of the day. He and Resta drove side by side down the planks in front of the grandstand time after time. The crowds yelled their approval, both having their supporters, but none of the cheering thousands realized that Pullen was racing a full lap behind.

De Palma, twice winner of the Vanderbilt cup, drove in fourth. De Palma

drove a careful, cautious race, never speeding more than was necessary and taking every turn with a good allowance for safety. The wisdom of this was shown when his competitors began rolling into their pits, either out of the race entirely or out for repairs until all chance at the money was gone.

Billy Carlson, in the Maxwell, drove a similar race, though he did not even appear to be in the winning class until long after the 60th lap. Little attention was paid to him by the crowds; only the experts in the Maxwell pits saw what he was doing and signalled their approval.

Burman Early Meets Trouble

One serious accident marred the day's sport. Bob Burman, a post entry driver who drove the car vacated by Grant when he allied himself with the Case forces, turned turtle and injured both Burman and his mechanic. Burman's injuries were slight and after being attended at the Emergency Hospital on

the grounds he and his wife went back to watch the finish. Joe Cleary, the mechanic, suffered fractures of the thigh and two broken ribs. A spectator was injured when the Edwards Special threw a tire when taking one of the turns.

Tom Alley lost control of the Duesenberg in the 37th lap and tore through a fence barricade for a distance of 150 feet. Both Alley and his mechanic saved themselves by crouching in the hood of the car. O'Donnell, driving the other Duesenberg, was also wrecked. His car skidded, jumped a bale of hay and turned over. The two racers picked themselves up, badly bruised. The car was damaged considerably, but went on its own power back to the pits.

Grant Failed on Water

Harry Grant, driving Cooper's car, the big Case, was the victim of a peculiar accident. He came to the pit for gasoline, but due to a mistake the gasoline

WINNERS AND THEIR WINNINGS; LOSERS AND WHY THEY LOST

Driver	Car	Time	Average	Prize
Resta	Peugeot	4:27:37	67.3	\$3,000
Wilcox	Stutz	4:34:36	65.6	2,000
Pullen	Mercer	4:35:37	65.3	1,500
De Palma	Mercedes	4:39:07	64.5	1,000
Carlson	Maxwell	4:44:12	63.3	500
Newhouse	Delage	4:45:38	63.0	...
Oldfield	Maxwell	5:52:47	61.5	...
Disbrow	Simplex	4:53:37	61.3	...
Young	Ono	Flagged, lap 77		
Klein	King	Flagged, lap 76		
Hearne	Case	Flagged, lap 76		
McKelvy	Overland	Flagged, lap 75		
Anderson	Stutz	Flagged, lap 73		
Gandy	Edwards Sp.	Flagged, lap 69		
Ruckstall	Mercer	Out, lap 72, broken axle		
O'Donnell	Dusenbergs	Out, lap 54, wrecked		
Grant	Case	Out, lap 51, water in gas tank		
Thomasini	Thomasini	Out, lap 43, burned out bearing		
Burman	Stutz	Out, lap 43, wrecked		
Cable	Thais	Out, lap 43, cracked cylinder		
Gordon	Gordon Sp.	Out, lap .. engine trouble		
Alley	Dusenbergs	Out, lap 37, wrecked		
Kennedy	Edwards Sp.	Out, lap 30, broken wheel		
Parsons	Parsons Sp.	Out, lap .. engine trouble		
Marquis	Bugatti	Out, lap 15, broken spring		
Francis	Francis Sp.	Out, lap .. engine trouble		
Durant	Chevrolet	Out, lap 7, stripped gear		
Rickenbacher	Maxwell	Out, lap 7, engine trouble		
Le Cain	Chevrolet	Out, lap 7, broken piston		
Nikrent	Mercer	Out, lap 4, engine trouble		



Upper: Resta, No. 9, whirling along the Avenue of Progress. Right: Resta leading on the Avenue of Commonwealths, which formed part of the course near the finish. Lower: Grant piloting the Case around a bad turn in the Vanderbilt course, with Hughes in the Ono close behind and going fast



his car resembled in their humming speed a huge bumble bee intent on reaching home. Nothing could turn them aside, nothing could stop them. The effect on the drivers behind them must have been disheartening in the extreme as the contest progressed.

Resta Hums Home in First Place

Resta's pace soon told on Alley and the former relinquished his lead in the 20th lap. When the race between Resta



and Pullen began the steady humming pursuit was almost nerve racking. Pullen was first across the finish line after Resta—Resta used the same set of Nassau tires with which he won the Grand Prize—and was hailed as second place man, but when the time allowance was estimated, Wilcox, the next finisher, was given second. And it was a hard-won second, too.

Oldfield Finishes Seventh

Barney Oldfield, always a favorite, puffed in after a steady race in seventh place. Disbrow, fourth in the Grand Prize, came in in eighth place on Saturday.

In every way the Vanderbilt was what the Grand Prize was not. Fair weather, a large crowd and dry track made the Vanderbilt a race, not a dismal, drenching mudfest.

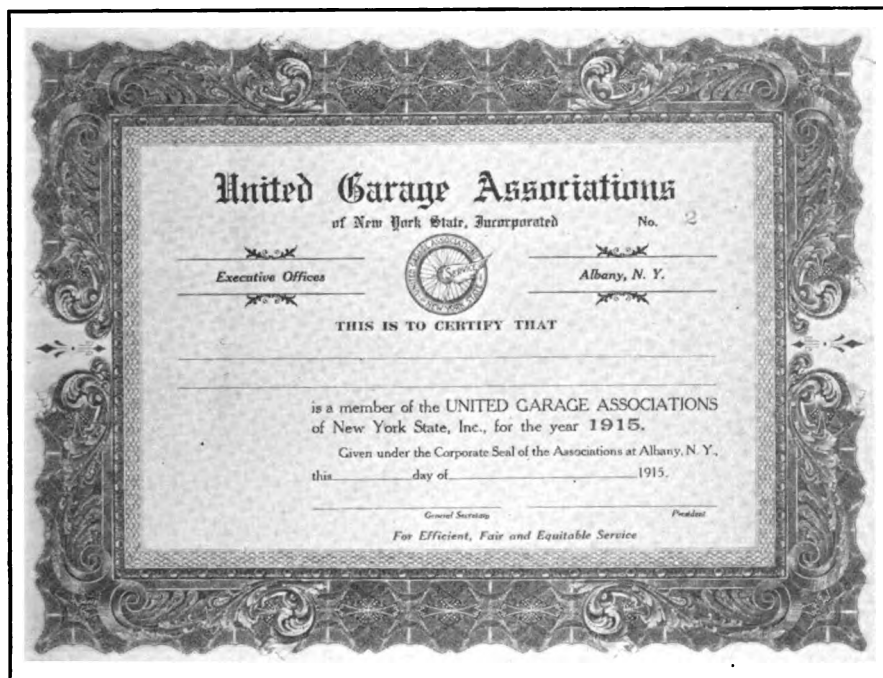
tank was filled with water. The car lasted half a lap and then went out. Minor accidents and trouble of various kinds gradually thinned the field after the first 20 rounds. But the accident to Burman and Cleary was the most serious of the race.

Alley Works Five Fast Laps

For the first ten laps the speed was excessive. Alley averaged close to 70 miles an hour for five laps, which meant over 80 on the straightaways. But the other drivers were not to be led on by such reckless work and held to a steady gait. Resta, especially, refused to be excited by the lead of other cars. He drove a monotonous, steady race, varying but a few seconds each lap. He and



Wilcox in the Stutz in which he won second place in both the Grand Prize and the Vanderbilt



Certificate which proclaims membership in the new garage body

New York Garagemen Organize State Body

Haradon Heads United Garage Associations of New York State, Inc.—Propose Emergency Credit Card and a Collection Service—Four Classes of Membership Provided

The organization of the United Garage Associations of New York State, Inc., which was tentatively formed in New York City January 6, was completed a week ago today, March 3, in Albany, the state capital. Plans as to legislation, an emergency credit card, an association collection service and other matters were discussed and the work outlined.

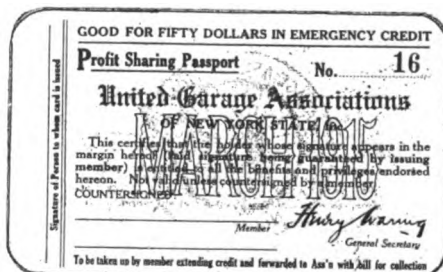
William M. Haradon, Royal Garage, New York City, was again chosen president; the other officers are: First vice-president, John Van Benschoten, Poughkeepsie; second vice-president, A. H. Dudley, Rochester; third vice-president, W. D. Whipple, Binghamton; secretary, Harry Waring; treasurer, Edward W. Leahy, Albany. Besides these there are twenty directors.

Emergency Credit Card to Be Issued

Attorney Melvin Bender, who has been retained by the organization, reported on legislative work in prospect; the measures include a law making it legal to sell gasoline, tires and supplies on

Sunday, something not now permitted under the Sunday closing law; a lien law which will give the garageman a lien on a car which has left the garage with a bill unpaid, and a law permitting the arrest of a man who attempts to defraud a taxicab or livery driver. Later the Legislative Committee will issue a bulletin on its work.

The organization work embraces an emergency credit card which will be issued by member garagemen of standing



A credit card would be issued by members for the use of their customers in emergency. This would be good in any member's garage, the amount of credit extended on it being charged back to the member that issued the card

to reputable customers for a small sum; this not only will serve to establish the identity of a car owner when touring but will entitle him to a credit of \$50 in case he meets trouble on the road. The credit extended by the garageman to the tourist on the card is to be charged back to the garageman who issued the card and the card is to be taken up by the garageman who extends the credit.

The cards are to be of a different color each month and are to carry the

ASSOCIATION DIRECTORS

William Haradon.....	New York City
C. Howard Potter.....	New York City
Edward W. Leahy.....	Albany
H. T. Warnick.....	Amsterdam
Frances Miller	Utica
J. Lawrence Hill.....	Rochester
A. H. Dudley.....	Rochester
A. Ward La France.....	Elmira
H. W. Whipple.....	Binghamton
Louis Blum.....	Stapleton
John Van Benschoten.....	Poughkeepsie
D. H. Cowles.....	Glens Falls
J. A. Henning.....	Mt. Vernon
Harvey J. Scott.....	Catskill
William Petry.....	Hudson
Martin H. Snyder.....	Kingston
Senator J. A. Emerson.....	Schroon Lake
C. A. Burdett.....	Hornell
Arthur Youngs	Newburgh
Henry Waring	Albany
Charles Kelly	Troy
C. W. Landers.....	Garden City

COMMITTEE MEMBERS

Committees	Members
Executive	John Van Benschoten H. T. Warnick Edward W. Leahy
Membership	M. H. Snyder J. Lawrence Hill Edward W. Leahy
Legislation	Senator J. A. Emerson John Van Benschoten
Arbitration	William Petry A. Ward La France E. W. Leahy
Purchasing	H. W. Whipple John Van Benschoten H. T. Warnick A. H. Dudley
Insurance	C. Howard Potter H. J. Scutt Francis Miller
Finance	H. T. Warnick C. Howard Potter A. H. Dudley

signature of the car owner to whom the card is issued. Investigation of members to whom cards are issued and the assurance by them that owners to whom cards are issued are reliable is designed to eliminate losses.

The organization has also planned a collection system. To members will be issued large books containing several forms; two of these are printed form dunning letters, Nos. 1 and 2. They carry the weight of the association letterhead and in case they do not get results the collection of the account may

(Continued on page 40)



General view of the Brooklyn show. The attendance was double that of two years ago; no show was held last year. This was a local show for Long Islanders. Idle sightseers were few and buyers many

Long Island Will Take 9,000 Cars for 1915

Indications Point to 50 Per Cent Increase Over 1914 Business—Total Value of Cars Will Be \$9,000,000

AN increase in business on Long Island of 50 per cent for the present year as compared with 1914 is a conservative estimate if the opinions of the exhibitors at the Brooklyn show can be taken as a barometer. These opinions were, however, based on figures for January and February of this year and last year and should not be far wrong.

This year probably 9,000 cars, valued at \$9,000,000, will be called for; last year more than 6,000 cars were sold in this territory, which has an area of 40,000 square miles and a population of over 2,000,000. Some of this new business is due to new cars, such as the Briscoe, Dodge Bros. Remington, Westcott; and also to the increasing popularity of cars introduced last year, as for example, the Chevrolet. Lower prices and more attractive products are also responsible for part in the increase.

The territory represented by the Brooklyn show is one of the largest and

richest in the United States; there are 29,000 cars registered in the four counties on Long Island, or almost as many as New York county, with 31,384 cars. The area of the island is 1,373 square miles and the population is 2,098,460, as against 2,762,522 for Manhattan Island.

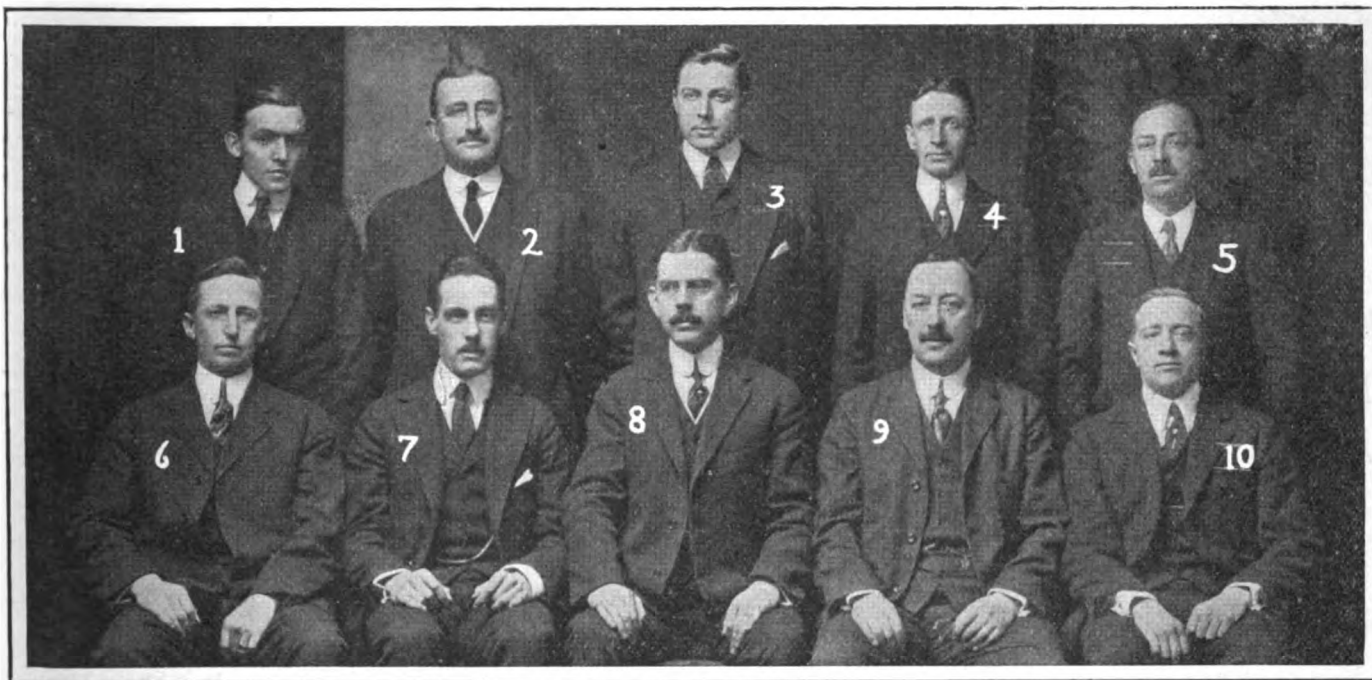
Primarily a Retail Show

The show is considered a success—all the exhibitors are agreed on this point. More cars have been sold, more live prospects obtained, and the crowd on the whole was more alive, more intelligent, and more interested than ever before. No show was held last year, but the great success of this one makes it a certainty that there will be another next year. The attendance was double what it was two years ago—largely on account of the reduction of the admission fee to 25 cents and the distribution of invitations, admitting two, to every owner on Long Island.

The Brooklyn show is a retail show

and a local show. It is just for the inhabitants of Long Island and is a show at which there are very few sightseers but many prospective buyers. The population is largely urban; approximately 1,900,000 of the population is found in the counties of Kings and Queens which comprises Brooklyn, Long Island City and a few suburbs. The other two counties, Nassau and Suffolk, have a mixed population. Nassau county especially is noted for its fine estates, and many wealthy people live in this section. Therefore this county is a very fertile field for the dealer with high-price cars, although the tendency is for these people to come straight to New York when they want a car instead of stopping off in Brooklyn.

In addition to this class there is a considerable number of farmers and truck gardeners, who demand cheap and moderate-priced machines. Also there are the townspeople throughout these counties who have grown well-to-do. These



Snow Committee of the Brooklyn Motor Vehicle Dealers' Association. (1) C. Corrigan (assistant manager); (2) W. H. Kouwenhoven (Locomobile); (3) A. E. Randall (Cadillac); (4) W. A. Sellon (Chevrolet); (5) C. A. Stewart (manager); (6) I. C. Kirkham (Maxwell); (7) C. W. Bishop (Dodge and Cole); (8) H. L. Carpenter (King); (9) H. Unwin (Chalmers); (10) F. H. Miller (Packard)

people also buy a considerable number of cars. There are only 83,930 people in Nassau county and 96,138 in Suffolk, so that after all the largest motor trade is found right in the city of Brooklyn itself.

This fact and also the comparatively small area of Long Island has resulted in very few subdealers being appointed. All the high-priced cars are sold directly through agents in New York or Brooklyn without the use of subagents in the smaller towns. The medium and low-priced cars are handled by subdealers to a limited extent, the proportion of dealers for any particular car depending to a large extent on the price, the very cheap cars having comparatively many dealers and the medium-priced cars few or perhaps none at all.

While the small size of Long Island and the fact that all but 150,000 of the people live in Brooklyn or its immediate suburbs renders a great number of subdealers unnecessary, many of the exhibitors at the show expressed the opinion that it would be better to have more representatives throughout Long Island, but that it was difficult to place agencies with live men and that no representation was better than poor representation.

Long Island Ideal for Motoring

Very few contracts for territory were made at the show; most of this work is done later. Just how many new dealers will be appointed this year is problematical, but from a canvass of the show probably the number will be not more than 25.

At present there are 45 dealers in Brooklyn, which is Kings county, and the population is 1,634,351; 10 in Queens

county, with a population of 284,041; 36 in Nassau, with a population of 83,930, and 40 in Suffolk, with 96,138 inhabitants. The dealers in Brooklyn are the main representatives for the whole island, while in the other counties there are subdealers.

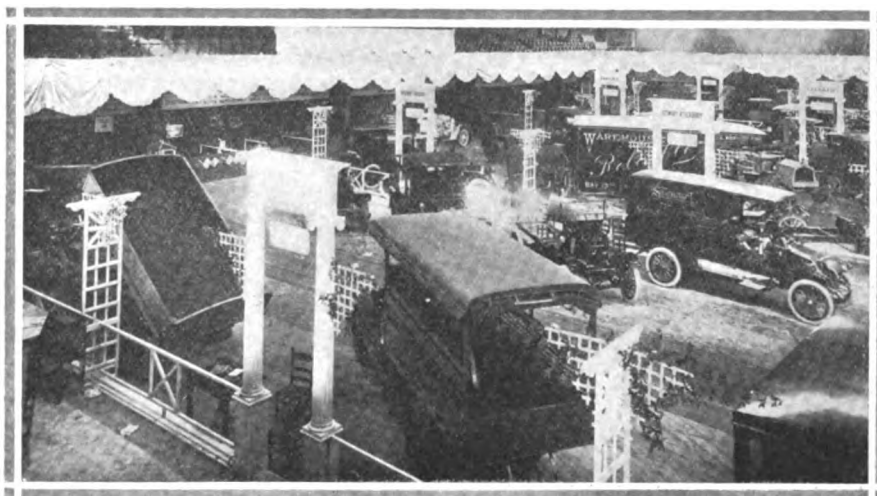
Long Island is ideal from the motorists' standpoint; the country is practically level; the South shore is absolutely so; although there are some short hills along the North shore, the roads are excellent. Besides, there is the Long Island Motor Parkway, which is a private speedway 45 miles in length and on which there is no speed limit.

The attractiveness of Long Island because of its good roads and also its many summer resorts, makes it almost a summer paradise for the motorist, with the result that there is a large transient

trade done by the dealers in the small towns throughout the island; most of these motorists come from Brooklyn and New York City.

Electric dealers expect a large increase in business in the near future. Brooklyn is an ideal electric city. Its streets are well paved, all the principal ones being asphalted, and it is almost as level as a billiard table. The electric affords the most convenient means of reaching New York.

The country surrounding Brooklyn is also very level and the roads are in exceptionally good condition, so that a more ideal district for the operation of these machines could hardly be imagined. To further the popularity of these cars one garage for electrics exclusively has recently been opened and two more are contemplated.



Long Island is a fine motor trucking territory, and the exhibits of trucks were representative and attracted much genuine interest

WIDE-AWAKE MERCHANDISING

LITERATURE IS TO READ

Don't Let It Pile Up in Your
Salesroom—Get It Into
Circulation

The waste of good advertising literature is still going on.

Everywhere you can see salesrooms where good printed matter—expensive, costly to the manufacturer—is lying idly on top of some cabinet or table gathering the dust of out-of-dateness. Or you can go into dark stockrooms and find piles of precious sales-seed literally drying up—curling at the edges and daily growing more useless.

One of the best resolutions that any dealer can make for this year is to get the sales-seed of advertising literature planted in the home of some possible customer just as quickly as possible. Don't be afraid to give it away for fear you cannot get more. The manufacturer will be delighted to furnish you all you want—if you USE IT.

There's Good In It. Get It Out!

The only man he begrudges is the fellow who leaves it piled up—who does nothing about it; that is, nothing helpful—and who finally shoots it out the back door to find an untimely and ignominious grave in the waste barrel.

There are two things tied up in the advertising matter that comes to you—the manufacturer's money, and sales possibilities for **you**. You owe it to yourself to make the sales possibilities sales realities. Do your obvious duty. Get the stuff out!

JONES OF WICHITA TELLS WHOLE STORY FIRST TIME

When the Jones Auto Exchange, Wichita, Kan., advertises its Fords, it is explicit as to price; the customer does not go to the salesroom and discover then that he must pay the freight. The dealer himself figures out all the excess charges and publishes these prices in his

WANTED

Fifteen young men to make an independent living in the "Jitney Bus" business. \$100.00 will start you. Get in while the getting is good. Be your own boss and make money.

I have fifteen automobiles ranging in price from \$350.00 to \$900.00 that I will sell on easy terms, \$100.00 down and the balance in monthly payments. The cars will pay for themselves in a short time and will also net you a nice income. You must hurry. This is an opportunity of a lifetime. I have any make car you want, from a Ford to a Pierce-Arrow, all in good running order. Come early and pick your car. I want to have all those cars on the street by Saturday. See Frank Navin at the Salt Lake Automobile Exchange, 109-115 West South Temple.

This is one of the newspaper ads which Navin is running and which is selling his used cars into jitney service

ads. The prices are just above the famous dotted line for the signature.

Robert Bland Electric Garage

Benson Avenue and Clark Street
Evanston, Illinois

Rules for Drivers of Electric Cars

1. Report on duty on time, in a neat and clean condition. Show your respect for the car owner, who often rides with you.
2. It is your duty to report all Car imperfections to the foreman.
3. Always hold up rug before entering Car.
4. Switch off all lights on entering garage.
5. Examine car thoroughly for damages, notify car owner of damage before bringing car into garage.
6. Always remember that you are not handling your own property and you should care for it as you would your own. As the car owner is your best friend, he makes it possible for you to hold your position.
7. Do not deliver a car under any circumstances that is not thoroughly clean and in first-class condition.
8. To use Liquor while on duty means your discharge.
9. Smoking in owner's car means your discharge.
10. Carrying your friends in owner's car means your discharge.
11. Exceeding the speed limit of Third speed means your discharge.
12. Driving on car tracks means your discharge.
13. Carrying home owner's key means your discharge.
14. In driving owner's car attend strictly to your own business. He does not want you to entertain him. He knows that you are a practical automobile man, without you telling him.
15. Strict attention to the above rules will afford the car owner perfect service and will make it possible for you to hold a remunerative position.

NOTICE

\$5.00 REWARD will be paid for name of haler operating cars out of this garage over Third (3rd) speed, without the consent of the car owner. Cars must not be operated in the garage over First (1st) speed.

Robert Bland Electric Garage

This shows one of the cards that adorn the walls of the Robert Bland Electric Garage in Evanston. Here are the things the drivers must do and also what they must not do. There can be no misunderstanding of orders

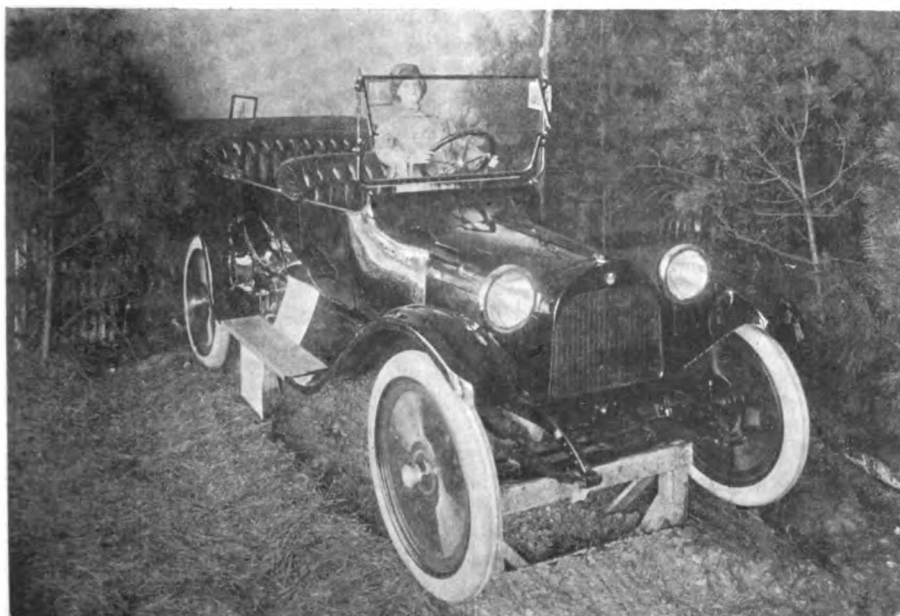
JITNEY FEVER PUT TO WORK

Utah Dealer Selling Used Cars
on Installments—Big Ads
Help Sales

The jitney bus, the five-cent-fare motor car which has made wondrous progress in a number of cities, offers the motor car dealer an excellent opportunity to move his used cars; a rebuilt car at a fair price is just what the jitney operator needs, and the arguments in favor of such sales are strong.

Frank Navin, of the Salt Lake Automobile Exchange, Salt Lake City, has evolved a plan of \$100 down and the remainder in monthly installments, the payments to be made out of the operator's earnings. He ran the accompanying ad as a part of his campaign. The jitney fever adds strength to such an ad.

The ideas of someone else may be different from yours. That's the very reason why you should study them carefully.



An Atlanta dealer put a Dodge Bros. car in his window, put the wheels on rollers and ran the car under its own power. An electric fan furnished a summer breeze

RUNS CAR IN SHOW WINDOW

Pegram Company Runs Car Under Own Power—Fan for Breeze

The Pegram Motor Car Co., Atlanta, Ga., wanted a window display with some action in it—and got it.

The photograph gives only half the idea of its attractiveness. Night and day when this car was running under its own power, inhabited by a lonely "lay figure" done in wax, there were crowds rubbing their noses against the Pegram Motor Car Co.'s display window and getting the story of both the price and looks of Dodge Bros. car. The car is resting on "horses" with the back and front wheels barely touching on rollers, a belt running from rear to front. It is running on high gear, which makes the back wheels pull the front and gives the car the effect of doing actual road work.

Note that the "wax lady" has a long veil that floats in a real breeze generated by a hidden electric fan, adding greatly to the lifelike effect. Observe also the simulation of the muddy road, with banks of grass on either side and trees in the background. It took some thought and some work to arrange this display, but it proves that the Pegram Motor Car Co. is right on the job and thoroughly receptive to modern ideas.

Another point they did not overlook was the value of the newspaper publicity they might secure. The car was started running Friday morning with all the local newspaper men present and was

run from 9 o'clock in the morning until 9 o'clock at night. From start to finish this display proved itself a good idea and it is to be hoped it is not the last.

RELIABLE AUTO SERVICE

PHONE NORTH 8477

PHILADELPHIA AVE AND HAMILTON BLVD.

SERVICE RATES

ELECTRIC CARS	PER MONTH	GASOLINE CARS	PER MONTH
Full Service	\$25.00	Full Service	\$15.00
" " less collecting and del.	\$2.50	Car space	10.00
Live Storage	9.00	Dead Storage	6.00
Dead "	6.00	Day Storage Only	7.50
Single Charge	1.00	Wash and Polish	1.50
Wash	1.00	Wash only	1.00
Wash and Polish	1.50	Charging of Ignition Batteries	

ALL REPAIR WORK (PER HOUR) 60C.

The card that the Reliable Auto Service Co. is sending out in advance of its opening

NOT OPEN YET BUT HUSTLING

Letter and Card Sent to List of Prospects Giving Prices and Data

The Reliable Auto Service Co., Philadelphia avenue and Hamilton boulevard, Detroit, has not yet opened its garage, but it will be completed in the very near future.

In the meantime there is no grass growing under the feet of the proprietors. The mails are working for them overtime and by the time the garage is open they will have many customers to fill it.

With a letter soliciting business they send a card that gives prices on almost everything that the man who wants storage cares to know about. The letter is short and to the point. And it is being sent to people who are logical neighborhood prospects. There is no question but that it will get them the business they want.

This is the letter:

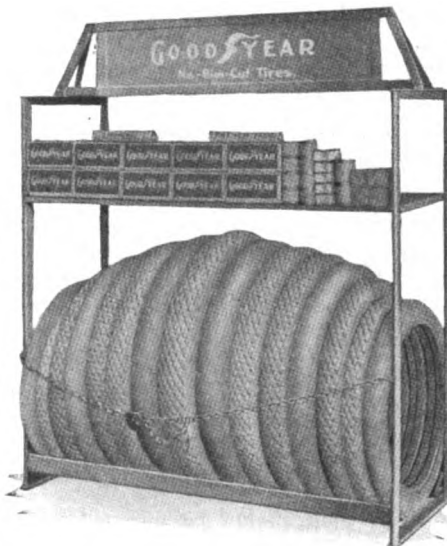
We wish to call your attention to the fact that a garage is now under construction for the care of electric and gas cars, in your neighborhood, with all modern conveniences, fireproof building, steam heat.

First-class mechanics will be employed at all times and will also have a full line of oils, grease, gas and accessories.

If you wish storage space we would be pleased to take the matter up with you at once, as space, commencing March 1, is now being sold.

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. One is illustrated herewith and this will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



The need of a rack with which to display tires properly probably is general, and to those that need them the Goodyear Tire & Rubber Co. offers the one illustrated herewith. It is substantially made and in addition to displaying tires has a place for tire accessories.

The rack is made of steel and will hold about 15 casings of various sizes, as shown. At the top there is the Goodyear trademark which draws attention to the brand of merchandise displayed.

The rack is furnished to any dealer at \$10 provided he also orders a stock of Goodyear casings and tubes. This price is f. o. b. Aurora, Ill.

Advanced Maintenance

BRAZING AND WELDING

By George Fernwell

(Continued from last week.)

ON that portion of the fire-clay mould immediately surrounding the joint between the broken parts of the casting a slight depression or shallow groove should be made, just sufficient to prevent actual contact with the metal but not deep enough to permit any considerable falling or flowing away of the metal of the casting in case it should be heated to the melting point.

Parts Must Be Aligned

The two broken surfaces of the casting must, when in position for brazing, be in close contact, and effective means should be employed to determine when the parts are properly placed relative to each other. Should each part of the casting have a machined surface, care should be taken that such machined surfaces are in proper relative alignment. A straightedge, square or sheet metal template may be used.

Clamp Broken Parts Together

In some cases it is practical to clamp the broken parts together. This should not be done, however, without careful consideration of the risk of the casting becoming badly warped as a result of the resistance offered by the clamps to expansion and contraction during the heating for brazing and the consequent cooling.

Mould Permits Expansion

The fire-clay mould, in addition to retaining the casting in its normal shape, should it become melted, has the good feature of offering no resistance to either expansion or contraction of the joint while being heated or while cooling.

Danger From Warping

The difficulties encountered in minimizing the extent to which a casting may warp after brazing are such as should be fully realized in order that the experience gained may be utilized when first attempting the work of acetylene welding, in which vastly greater difficulty will be experienced from the same causes.

Holes Must Be Plugged

To return to the job in hand. If there are hole holes, or deep recesses, near the

joint to be brazed in the casting, these should be plugged solid with moist fire clay or graphite before embedding the parts in the fire-clay.

Care Needed At All Times

While reference has been made to the use of a fire-clay mould as a precaution against metal flowing away if melted, it must not be assumed that the need for

Brass Brazing Maxims

Do not unduly prolong heating; it burns out the zinc.

Brass castings are easily broken at half brazing heat.

Use care in clamping parts together to avoid warping

Carefully align parts, working from machined surfaces.

Plug all holes with moist fire clay or with graphite

Braze first one side and then the other if necessary

Clean castings by sand-blasting or pickling in acid

Fire clay mould permits metal to expand and contract

caution is eliminated because of the safeguard thus provided. On the contrary, the inexperienced workman should proceed with the same caution and concentration he would have to employ in trying to braze without the mould.

Prolonged Heat Burns Out Zinc

To expose the parts of a brass casting for an excessive length of time to a melting heat would result in the zinc being burnt out of the brass and the consequent weakening of the casting itself. The joint should be heated, borax applied as previously described for ordinary work, and at the first sign of a red heat at the joint spelter should be applied. Brass should braze thoroughly at a dull red heat.

Keep Flame Steady

The flame should be directed at the joint steadily and continuously in order

that the actual brazing may be accomplished as quickly as possible, not only to save time, but to shorten as much as possible the period of exposure to nearly or quite a melting heat.

Brazing From Both Sides

Should the work proceed successfully and quickly the joint may be brazed completely through from top to bottom at one operation, but should difficulty be experienced and the work subjected to unduly prolonged application of the blow-pipe flame without the joint being brazed completely through, it may be advisable to allow the work to cool sufficiently to remove it from the fire-clay mould, turn it over and braze from the reverse side. The same care as before must be taken, however, in embedding the work in a new mould of fresh fire clay and in pressing it down level with the top of the fire clay.

Sand Instead of Fire Clay

A substitute for fire clay may be found in moulding sand such as is used in brass foundries for moulds in which to make brass castings.

Brass Brittle At Half Heat

After brazing is successfully accomplished the work should be allowed to cool slowly and completely. In some cases, if not all, brass is apt to prove brittle and therefore easily broken at considerably less than half the brazing heat.

Sand Blast for Cleaning

An effective aid to cleaning off superfluous flux so that superfluous spelter may be readily filed is a sand blast. This must be used, however, with care to avoid cutting minute recesses in the surface of the casting adjacent to the part being repaired.

Pickling Castings in Acid

Another means for cleaning brass before and after brazing is a "pickle." The brass should be dipped in a weak solution of vitrol and water in the proportion of half pint of vitrol to from four to six gallons of water, quickly rinsing the casting in clean hot water and drying in sawdust. Or the brass may be quickly

dipped in nitric acid and immediately plunged into boiling water and then dried.

To prevent spelter and flux running

over the surface adjacent to the joint, the latter may be coated with a graphite paint or paste or a mixture of black lead and machine oil.

practical to bind the broken parts together with soft iron binding wire; in other cases fire clay may be used to form a support; but in the case of cast iron the fire clay is not required to support the metal when melted. Fire bricks or charcoal should be arranged all around the work with the exception of an opening for the blow-pipe flame.

Detailed Instructions for Brazing Cast Iron

Special Flux Permits Spelter to Hold—Cleaning Important

Until recent years the brazing together of broken cast iron, that is when it was really cast iron, was not successfully accomplished.

It is only within recent years that the brazing together of broken cast iron, as distinguished from malleable cast iron, has been successfully performed.

Graphitic Carbon Repels Spelter

According to some authorities the cause of the difficulty in making spelter adhere to cast iron by ordinary brazing methods was the excess of graphitic carbon present in cast iron, which would prevent the ready flowing and adhesion of spelter. Success involved the discovery or invention of a means or process whereby the excess of carbon could be eliminated from the surfaces to be joined for a depth of at least 1/16 inch.

Most Processes Kept Secret

Such processes as have been discovered have been kept somewhat secret, the details of the composition of the materials used being withheld.

Good Cast Iron Brazing Process

The rights to only use processes involving special preparations, such as fluxes or acids, are leased. One of the best of the modern methods is called the Ferro-Fix brazing process and is covered by patents. The flux and carbon eliminating preparations in this process are so effective that in brazing the spelter is known to actually penetrate the iron itself. The materials and equipment may be obtained from the American Ferro-Fix Brazing Co., of Philadelphia, Pa.

Vial Process Public Property

The details of a successful flux and process for brazing cast iron, on the other hand, were freely given to the public by Ethan Vial in the pages of the American Machinist, April 25, 1907, and with it the writer has obtained uniformly successful results. For a flux it is required to obtain one pound of boric acid, four ounces of chlorate of potash, three ounces of carbonate of iron. These ingredients should be mixed together dry and in turn mixed with medium sized grain spelter.

The chlorate of potash must be thoroughly pulverized and sifted. The mixture must be kept dry, as moisture or

even exposure to the atmosphere will weaken the flux. This combination of flux and spelter may be used in practically the same manner as borax and spelter are used in ordinary brazing. The general methods of procedure applied to brazing cast iron by all processes may be outlined.

Preparing Cast Iron for Brazing

Clean the surfaces of the cast iron thoroughly with a wire brush until they

Iron Brazing Maxims

Surfaces must be cleaned until they are actually bright.

Parts to be joined must be in closest possible contact.

Gradual cooling of brazed castings is of great importance

Special flux must be kept dry and protected from the air.

Heat of metal must be sufficient to cause spelter to flow.

Double burner blow-pipe preferable for this class of work.

Cast iron is much more difficult to braze than brass

Sand blasting saves much time in the final cleaning.

are actually bright. Burn off grease with torch or muriatic acid. The acid will be most effective in removing grease from the surface if the cast iron surface while heated with the torch is dipped into or brushed over with muriatic acid. A most effective way of cleaning the surfaces of such an irregular contour as that of cast iron where broken is to use a sand blast. By this means every minute crevice of the broken surface is penetrated and effectively scoured.

Means for Supporting the Parts

Thoroughly coat the surface with whatever special cast iron brazing flux is being used. Arrange the casting or the broken parts of the same in their proper alignment on the fire brick brazing hearth. Take especial care that the surfaces to be joined are in the closest possible contact. In some cases it is

Casting Must be Heated Uniformly

A double burner blow-pipe outfit is preferable for brazing cast iron, to work quickly and effectively, most cast iron repair work having considerable mass to be heated. With the broken parts fluxed and supported in their proper position on the brazing hearth and surrounded with heat retaining fire bricks or charcoal, direct the flame of the blow-pipe steadily and continuously on the joint, and heat the casting to nearly a straw color and so regulate the flame that both sides of the fracture or the work are heated uniformly, as may be indicated by the color.

Spelter Must Penetrate Joint

Use a spatula made from ¼-inch round rod flattened to the shape of a miniature mason's trowel for applying the flux to the joint as soon as it reaches the above described heat, and next apply spelter and flux together. An important point to bear in mind here is that the heat of the metal must be sufficient to melt the spelter and cause it to disappear within the joint without the aid of the blow-pipe flame. Feed spelter until it can be seen that the spelter has penetrated completely through the joint.

Filling Crevices with Brass

At this stage the flame may be turned off and additional spelter quickly applied in order that crevices near the exterior of the joint may be filled up with spelter which, although still melted, is not as completely liquid as when the blow-pipe flame was playing on the joint.

Cool the Casting Gradually

The casting must be allowed to cool slowly; therefore, it is best that after having made sure the joint is thoroughly brazed to not further disturb the heat retaining fire brick or charcoal, thus making the cooling process more gradual than if immediately exposed to the air. The joint may be cleaned up by filing, chipping with a chisel, or grinding with an emery wheel. Considerable labor will be saved by a sand blast.

Danger of Warping is Serious

In brazing cast iron the danger of warping is in some cases a serious one, especially, for instance, in brazing a broken spoke of a wheel. An understanding of what takes place is required in order to make practical use of any suggested precautions to minimize the danger of the work.

(To be continued)

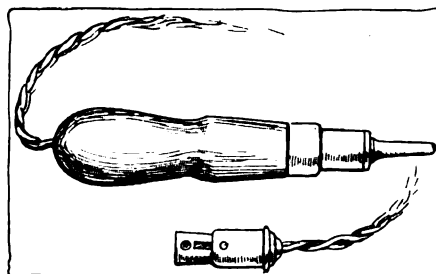
RECENT DEVELOPMENTS in ACCESSORIES

Small Cut-Vulcanizing Tool

For vulcanizing rubber placed in small cuts in tires a special tool has been developed by Mabey's Electric & Mfg. Co., Indianapolis; it can be heated by current from either a 6- or 12-volt storage battery.

The appearance of the instrument is much like that of an awl, the point, however, being stubby and rounded. An 8-foot flexible cable with connector terminal leads from the end of the handle, which is of hard wood and nicely polished. The cut in the tire is cleaned out well with a little gasoline, a filling of rubber put in and kneaded with the point of the tool, which is connected with the battery to heat it.

The little vulcanizer is 6¼ inches long



Mabey's cut-vulcanizing tool is electrically heated from the battery

bushed holes in the bottom cover, which screws securely into the cylindrical casing; the guide thus formed, together with the piston, keeps the spindles always in line and side sway is avoided.

Spring tension can be adjusted by means of the nuts at the tops of the spindles, cotter-pins holding them from backing off. The springs are of vanadium steel, the spindles drop-forged and oil-tempered, and the bushings in which the spindles slide of Velvet bronze, which is another product of the manufacturers.

The price of the Twinkoil shock absorber is \$15 for a set of four; dealers, less than 5 sets, 25 per cent.

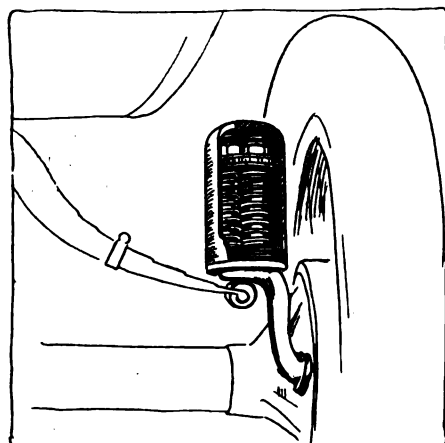
Reel Dash and Inspection Light

A particularly convenient form of reel light, which can be used with equal facility for either dash illumination or for inspection at a distance from the dash, is one of the products of Cumings Bros., Flint, Mich. When used as a dash lamp it can be swung around so as to illuminate any instrument mounted on the board.

A round reel casing, in which the electric cable is wound by means of a little crank, is mounted on the dash, and in the

periphery is a socket, in the center of which is the opening through which the cable passes in and out. When the cable is wound up the stem of the fitting in which the lamp itself is mounted is screwed into the socket; by turning the lamp in a ball-and-socket joint the light can be thrown on any part of the dash within its radius.

The lamp is mounted with a reflector and in the stem is a key socket for turning the current on and off. Type A, which is designed for cars without the cowl dash and for Fords, has a hemispherical reflector, and Type B has a bonnet or cylindrical reflector which effectively protects the bulb. All wiring connections are concealed. Type B is intended for cars with flush type in-



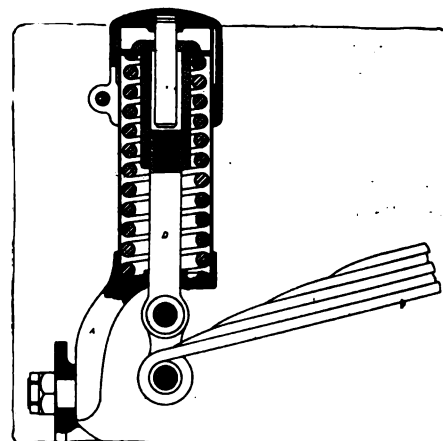
In the Twinkoil shock absorber both springs and air cushions are used

and consumes ¾ ampere. Price, with a supply of rubber for mending cuts, \$2.75; dealers, \$24 per dozen.

Twinkoil Ford Shock Absorber

Compressed air and spring action are combined in the Twinkoil Ford shock absorbers manufactured by the American Car & Ship Hardware Mfg. Co., New Castle, Pa. Springs are relied upon to take care of ordinary compression shocks and rebound is taken up by a pneumatic cushion.

The cylindrical casing contains two coil springs placed side by side; the spindles which pass through the springs terminate in a piston made up of two steel disks clamping between them a leather washer. The piston is at the top of the casing, and the space above it is calculated to provide the proper cushioning effect for checking rebounds. The spring spindles slide through renewably



The O. G. shock absorber takes up both up and down vibrations

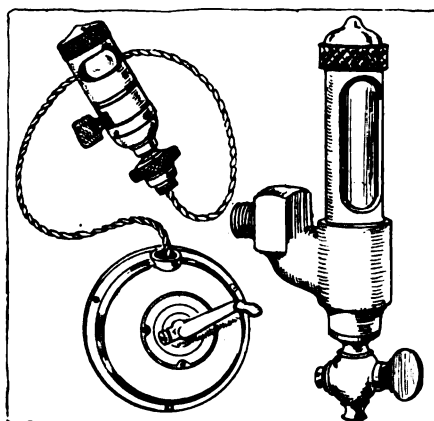
strument boards and when installed projects less than an inch from the board. Both are finished in nickel and highly polished.

Price, type A, \$3.75; type B, \$4. Dealers, \$2.85 and \$3.

Oil Gauge for Ford Motors

An oil gauge that can be attached to any Ford motor crankcase is manufactured by Cumings Bros., Flint, Mich. The instrument consists of a metal column with long vertical openings through which can be seen a glass gauge tube; at the bottom is a small petcock through which oil can be drained and at the back is a threaded connection which screws into the crankcase. A knurled cap at the top screws down on the glass tube and can be removed in case the tube is broken and needs replacing.

The gauge is 4½ inches high and can be screwed in place in a few minutes. The price is 75 cents; dealers, 40 cents



Two Cumings specialties. Left, reel dash and inspection lamp. Right, Ford oil gauge

each. The construction is heavy and substantial.

O. G. Double-Acting Shock Absorber

A Ford shock absorber of the auxiliary spring type that cushions vibrations both up and down is manufactured by the Oxygen Generator Co., Inc., Troy, N. Y., and is styled the O. G. shock absorber.

There is a single spring of the coiled type, and its tension is adjustable by an unusually simple method. The cap which covers the casing at the top is connected to the adjusting screw, and to make an adjustment the pinching-screw which clamps the cap in position is loosened, the cap turned by hand until the desired tension is obtained, and the clamping-screw again tightened. All nuts are prevented from loosening by lock nuts and bearings are lined with bearing metal and lubricated by grease cups.

For a set of four the price is \$9; for a pair, either front or rear, \$5. Dealers, 1 pair or 1 set, 25 per cent; 2 sets, 30 per cent; 4 sets, 33½ per cent; 25 sets, 40 per cent.

Pistol-Grip Hacksaw Frame

A hacksaw frame that is more than usually comfortable to the hand is the pistol-grip hacksaw frame manufactured by the Goodell-Pratt Co., Greenfield, Mass. This tool is adjustable for blades of any length from 8 to 12 inches.

The frame bars are ¼ x ¾ stock and the handle of rubberoid, shaped to fit the hand and checkered, and is held in place by two screws. The blade can be set in four positions. The finish is in nickel plate. Packed one in a box.

Price, \$18 per dozen.

Goodell-Pratt Socket Wrench

A convenient and substantial ratchet socket wrench is manufactured by the Goodell-Pratt Co., Greenfield, Mass., for use wherever a ratchet is of advantage; the tool is designated as No. 419. One of its good points is that it has a ball-bearing lignum vitae knob on the top, like a brace, so that pressure may be applied comfortably and effectively. The handle is of iron, 8 inches long, and the ratchet mechanism has a shifter which permits the tool to be used either right- or left-handed. The handle is finished in japan and other parts polished bright. Each wrench is packed in a box 8½ x 4¾ x 2½; weight, 1¾ pounds. Sockets of various sizes are furnished.

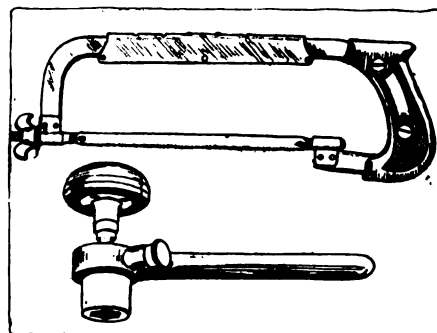
Price, \$1.50 each.

Simplex Hydrometers

The Simplex Hydrometer Co., New-ark, N. J., specializes in hydrometers for every purpose, with both printed and hand-written scales. Battery hydrometers, printed scales, Beaume and Specific Gravity, length 4½ inches, packed in wood box with flannel bag and test jar,

\$3 per dozen; dealers, \$1.80. Special grade, Beaume scale, 10 to 40 degrees by 1 degree graduations, 5 inches long, packed in wood box, \$6 per dozen; dealers, \$3.60.

Gasoline hydrometers are made with and without thermometers. Ordinary grade, printed scales, Beaume scale, 40

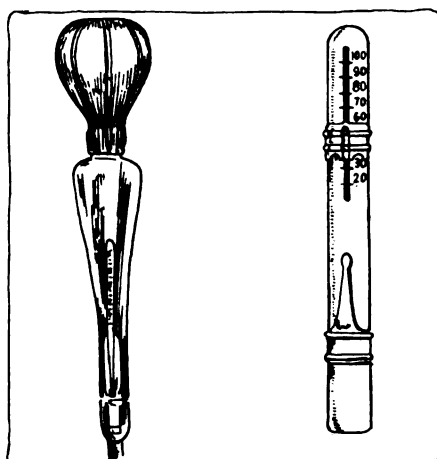


Two Goodell-Pratt tools. Upper, pistol grip hacksaw frame. Lower, ball-bearing socket wrench

to 90 by 1 degree graduations, length 10 inches, packed in round wood box, \$3 per dozen; dealers, \$1.80. Pocket size, 5 inches long, printed scales, Beaume scale, 60 to 90 by 1 degree graduations, with glass test jar and flannel bag in wood box, \$3 per dozen; dealers, \$1.80. Pocket size, with thermometer, 6 inches long, mercury weighted, in flannel bag with test jar packed in wood box, \$12 per dozen; dealers, \$7.20. Same in nickel case, \$18 per dozen; dealers, \$9. Simplex freez-meter for testing radiator solutions, with thermometer, packed in nickel case with test jar, \$18 per dozen; dealers, \$9. Without thermometer, \$6 per dozen; dealers, \$2.40.

Taylor

Hydrometers for gasoline, electrolyte and anti-freezing radiator solutions are



Left, Taylor self-contained hydrometer. Right, Allen pocket tire gauge

manufactured by the Taylor Instrument Companies, Rochester, N. Y. The standard grade Chargometer, which is a battery hydrometer, has a large glass body containing a long hydrometer marked

with specific gravity scale 1150 to 1300. Rubber buffers at the ends of the glass body protect it from accidental breakage. Total length, 14 inches; packed in wood box with slide cover. Price, \$3.50.

A \$2 Chargometer is made having a plain tubular glass body with rubber buffers; the hydrometer is graduated for the same range as the standard grade instrument, but the graduations are not so fine. Length, 12 inches; packed in box.

A hydrometer designed to be carried in the tool-box of the car is made at \$1.15; it has glass body, good quality rubber fittings and is packed in a strong cardboard cylinder. The hydrometers used in these instruments are supplied without the syringes, packed in round wood boxes, at 50, 65 and 75 cents each. A special separate hydrometer is marked with both Beaume and Specific Gravity scales and having a thermometer in the body. This is packed in a nickel-plated case with glass jar and flannel pouch; price, \$1.50; in wood case, \$1.25.

Gasoline hydrometers are made with and without thermometers; they are marked with Beaume scale from 40 to 90 degrees. Thermometer type, in nickel case with glass jar, \$1.50; in wood case, \$1.25. Without thermometer, in nickel case with test jar, 75 cents; in wood case, 50 cents.

The Freezometer, for testing anti-freezing solutions, is a hydrometer with a thermometer in its body. The hydrometer scale is made for taking readings from denatured alcohol solutions and the thermometer is used, in connection with a correction scale which is furnished with the instrument, for obtaining accurate readings. Packed in nickel case with glass test jar, \$2; in wood case, \$1.50.

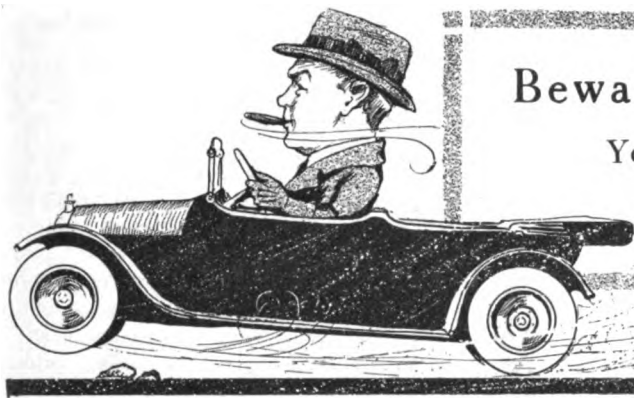
The dealers' discount varies with the quantity ordered, from 25 to 50 per cent.

Allen Pocket Tire Gauge

The Allen Auto Specialty Co., New York, manufactures, among other things, a tire gauge of the pocket type in which the indication is held by an exterior band sliding over numbers on a tube. The reading is obtained by pressing one end of the gauge on the tire valve. The instrument is 4½ inches long and ½ inch in diameter; the body is of brass tubing and the spring of piano wire. The scale is marked up to 100 pounds. Price, \$1. Dealers, 75 cents each; \$8.40 per dozen.

Van Tilbury Grinding Compound

Valve grinding compound is put up in cans of two sizes by the Van Tilbury Oil Co., Minneapolis; small size contains 1½ oz; two grades, fine and medium, are put up in a carton. Price, \$3.50 per dozen. Half-pound cans of fine, medium or coarse grade, \$6 per dozen; dealers, 40 per cent in lots of 100 pounds or more. The compound is so prepared as to be fibrous and does not melt.



Beware The Shrinking Habit!

You're Just as Good as Any Prospect, Says
Reilly—Hold Up Your Head

By Ray W. Sherman

AT the rate Reilly had been running that demonstrating car around town he might almost be classed as a business-neglecting joy-rider. The car had been seen in more places than a business-getting demonstrator could possibly be seen in legitimately.

But there was a good reason for it; the Common Council was having its periodical spell of spring law making and as usual had decided that the motor car industry was too important to be overlooked; so, as usual, they were trying to saddle a few burdensome regulations onto the dealers—to all of which the dealers objected.

Reilly had drawn down the job of marshalling an opposition at an aldermanic hearing, and he was acting as a whip in rounding up some of the lagging dealers and was doing personal work to assure a good showing when the ward dignitaries consented to listen to the story of the motor car men.

Reilly pulled up in front of Henry Bennett's Redman salesroom. Henry's heart was in the right spot, but he needed prodding a little bit. He was strong for the trade association, but he didn't always get out and work the way he should.

Henry Promises Numerously

Reilly found Henry busy with a prospect, so strolled down to the back of the salesroom and sat down at a little flat-topped desk to wait until Henry got the man's money or had to put it off till a later day. It was the latter that happened. Henry didn't seem to be working very well today and failed to get the money.

When Reilly went after him on the aldermanic meeting proposition he did as most of the other laggards and promised to be on hand when the hearing was held. To make sure of it Reilly exacted the promise from him several times, and each time Henry became more insistent that he would be there. Reilly started for the door.

"Pretty nice little car," commented Reilly. He stopped to look over the little Redman touring model which was becoming a popular vehicle in more towns than Callawassa.

"Some little car, Reilly! Nice job!"

"Going to sell one to the fellow who just went out?"

"Hope so," smiled Henry. "I think he likes it. I thought I would get him today, but he didn't seem to come across for some reason or other."

Reilly Clears for Action

"Do you know?" Reilly always began a piece of advice this way. "Do you know, Henry? I think there is just one little point on which you could do a little better. You probably don't realize it; in fact, no one ever does, but if rectified it may mean a whole lot."

"There are a whole lot of points on which I could improve," replied Henry. "If I know what all of them are and set out to put them right I could be a world-beater over night."

"We're all that way, Henry. I don't know what would happen if every salesman in the world could suddenly find out all his faults and become a perfect salesman. I suppose there would be such a deluge of efficiency and high-grade competition that the poor consumer would be loaded up with stuff he never knew existed and that would be the end of all selling; there wouldn't be anything left to buy with."

Both of them laughed. Henry said: "But what did you have in mind, old war horse? You have given me a few good tips since I started in with the Redman and I really am thankful for them. What's this one?"

Needed to Hold His Head Higher

"Well—," Also Reilly was prone to start a story with 'well.' "Well, as near as I can get to it, you don't think you're as good as the man you're trying to sell. You don't hold your head up and act as if you were as good as he is. You are apologetic."

"Not as good as he is? Apologetic?"

"Why yes, in a general way, that's it. Maybe you can say it in some other way, but that's about what I'm trying to get out of my system."

"Well, what am I going to do about it?"

Reilly shrugged his shoulders. "Brace up; I guess," he laughed. "Take a couple of drinks the next time you try to sell a man."

"You don't mean that!" was Bennett's horrified exclamation. "Take a few drinks! Who ever heard of such a thing?"

"No," was Reilly's laughing response. "Certainly I don't mean to take a few drinks. Far from it! But the effect is what you need—provided booze affects you that way."

"What way?"

"Gives you a better opinion of yourself," explained Reilly. "I noticed when you were talking to that prospect who was in here that your genteel attitude was one of inferiority to him. You acted to him as if he were doing you a favor in coming in here and that if he bought a Redman he was getting part value for his money and the remainder he was donating to you as a favor. You didn't put yourself on the same level with him."

"He's nothing but a groceryman out on the West Side!" exclaimed Bennett, nettled at the insinuation that the grocer might be in a higher class than a motor car dealer.

Acquired the Shrinking Habit

"Certainly! Who said he was any better than you? What I said was that you acted as if he were better than you! And you did!" asserted Reilly. "Naturally you may be a little shrinking, or since you started out to sell cars you may have acquired the habit. It is something a man is quite likely to do. When you are doing business with a prospective buyer you should always act as if you



"You don't hold your head up and act as if you were as good as he is"

are just as good as he is, even if he is John D. Rockefeller. Old John D. may have a little more money than you have and may get his name in the A. P. stuff a little more often, but when it comes right down to the worth of the man and his moral standing in the community he is not one bit better than you are.

"Yet if you went in to talk to John D. Rockefeller you very likely would feel somewhat awed and impressed with the idea that you were in the presence of a superior being. In that you would be wrong—wrong from the standpoint of good salesmanship and wrong from the standpoint of fact. You are just as good as he or any other man. Now—all you need to do is make yourself believe it!"

"Yes! Fine!" was Bennett's scornful response.

"I know! I know!" insisted Reilly. "You have that idea implanted in the back of your nut and it's hard to get it out, but that's what you've got to do. You must convince yourself that you are just as good as any man alive, and when you step up to him to sell him a car act as if you were just as much a business man as he is. Is there any reason why

you are not just as good as he is?"

"I may not be as big in a business way," pleaded Bennett.

"But is that any reason why he is any better than you are?" demanded Reilly.

"I suppose not," replied Henry.

"When a fellow finds himself afflicted with the little feeling which seems to have got into your system he ought to lay out a little course of discipline for himself."

"Yes?"

Get in Front of a Mirror

"He ought to take a good look at himself and see just how he is acting and why. He ought to get up in front of a looking-glass or something like that and see just what he looks like when he is trying to sell a car. If he has a hang-dog look and seems to——"

"Do you really mean to get up in front of a mirror?" questioned Henry.

"Oh not necessarily!" was Reilly's answer. "What you need to do is to make up your mind that you are going to brace up and act as if you were just as good as the next man—no matter whether you are or not. And never act funny like a kid. Try to gain the dignified and manly way; stand squarely

on your own feet. Hold your head up and look the man in the eye, not out the window. You're talking to him, not the window.

"Get away from the car; don't stand around and lean on it. If you can't stand up, sit down! But don't half lie down against the car. Be a man and act like a man and don't ever let the prospect suspect you are anything else.

"I suppose the Redman's a good car, isn't it?" suddenly demanded Reilly.

"I should say it is!"

"Is it worth the eleven hundred you ask for it?"

"Absolutely!"

"Well, then, why act as if the man were not getting his money's worth when he buys one? You have honest goods to sell, it is an honest value for the money, you are an honest man, you are just as good as any prospect that ever walked into the store, so why not brace up and act as if you really believed those things about yourself and the car?"

"Might not be a bad idea," answered the Redman dealer.

"Try it!" Reilly started for the door. "And," he added, "don't forget that ordinance meeting."

Sales-Service Building Is a Model of Its Kind

Air of Quiet Elegance in New Blevins Quarters—Separate Used Car Dept.

Just a month ago the Blevins Auto Co., Toledo, took possession of its new home, costing about \$100,000. This building is one of the most modern in the west and is designed specially for automobile service. It is of fireproof construction throughout, with cement floors.

The retail salesroom and offices of the company occupy the entire ground floor space of the white tile building. The salesroom is large and gives ample room for a generous display of all Studebaker models. The walls and ceilings are finished in white, with pillars and trim of early English oak, with indirect lighting system for illumination. There is a neat private office for Mr. Blevins, also for each of the several heads of departments. The salesmen are provided with desks immediately on the sales-floor.

About the whole place there is an air of quiet elegance and honest worth that is pleasing to the eye and makes one feel instinctively that the Blevins store is built for business and not for idle, ostentatious show.

Directly over the showroom is a department devoted to the storage of service parts. Accessibility and economy of space have been studied carefully in the

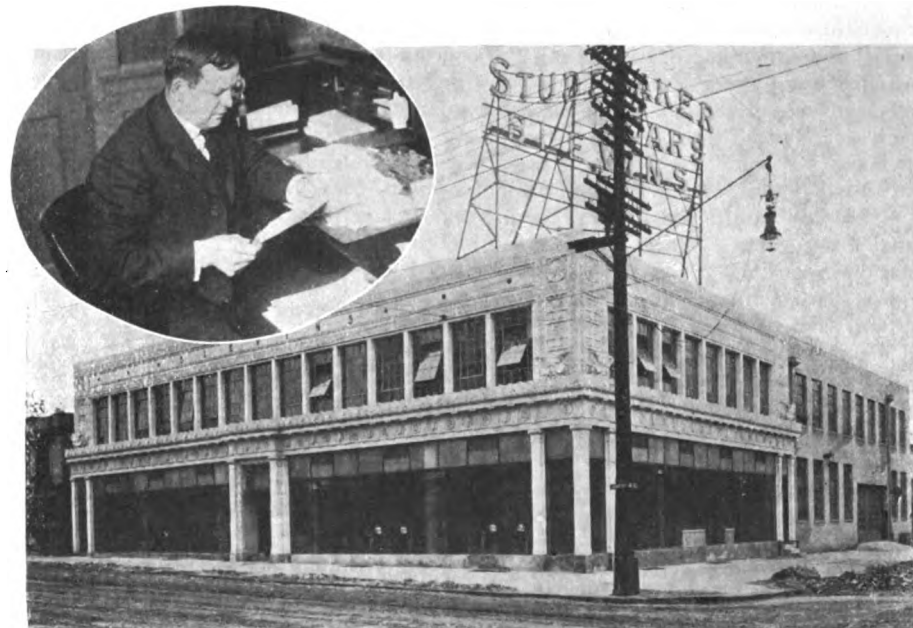
arrangement of bins and shelves and many good ideas have been worked out. Back of this service stock is the service repair department, with a complete outfit at its command.

At the rear of the tiled portion of the building will be noted the garage entrance. The entire ground floor of this portion of the building is set apart for garage purposes. Every facility is afforded the Toledo customer.

One of the special features of the new building is the "Used Car Dept." This

department has a special salesroom, entered from the main salesroom. When one enters this room there is not a suggestion to take the mind off the object of being there—to look at used cars.

At a formal opening of the building the salesroom was beautifully decorated and the general public widely invited to be present. Of course, there was a big crowd, for everybody in Toledo and the surrounding towns knows H. W. Blevins and is proud of the success he has made.



The new home of the Blevins Auto Co., Toledo, is a beautiful white tile building; walls and ceilings are finished in white with the trim of early English oak. Insert shows H. W. Blevins

N. Y. State Garage Organization

(Continued from page 29)

be turned over to the legal department of the association.

The plan includes a sight draft which is mailed to a bank with the customer's statement for collection; it is, however, not to be protested. There are also forms for the sending of accounts to the association for collection, forms for the request of confidential reports, forms for application for bonds, and forms on which the member may request reports on out-of-town debtors on whom it is desired that a watch be kept as to changes in financial status.

A booklet containing a list of members in each town, with the name of an approved attorney, physician and hotel, for the benefit of tourists is to be published. It will be of vest-pocket size and will be styled the Red Book. A membership certificate is provided.

Senator James A. Emerson, of Schroon Lake, a garageman and member, said he favored a bill adding 2 mills to the state tax and doing away with all burdening of the motor car trade with fees and other levies for the maintenance of roads.

A representative of an insurance company said his company was prepared to give members a blanket policy covering compensation and liability insurance, for which insurance nine different policies are now required. This, he stated, will effect a saving of about 30 per cent.

Membership in the organization is of four classes—auxiliary, general, associate and honorary. An auxiliary member is an organization of garagemen in a city or county. A general member is an individual or corporation in a locality where there is no organization. An associate member is a manufacturer or wholesaler connected with the industry. An honorary member is one elected for meritorious service, according to the general understanding of the term.

Auxiliary and general members have a voice and a vote; associate members have a voice but no vote; honorary members have no voice except by permission and may not vote. The initiation fee is \$10 per capita and dues \$3 semi-annually per capita. Each member association is entitled to two delegates for the first ten members and one for each additional ten or fraction thereof. General members get one vote each if present in person. Nominations are by committee, with independent nominations permissible upon a petition signed by ten members.

The convention was addressed by President A. J. Deere of the New York State Automobile Association, and the garagemen later attended a meeting of this association's directors at the Hotel Ten Eyck; the garagemen also called on Governor Charles S. Whitman, who shook hands with all of them.

\$83,678,812 NET SALES MADE BY U. S. RUBBER CO.

**Low Prices Bring Figures Ten Millions
Below Last Year — Dividends
Amounting to \$6,945,388
Are Paid**

The annual report of the United States Rubber Co., the first since the company changed its fiscal year to correspond with the calendar year, shows net sales of \$83,678,812, a reduction of about \$10,000,000 from the previous 12 months. This was occasioned, according to President Colt, by the prevailing low selling price of manufactured goods, the volume of merchandise sold having been somewhat greater than in 1913.

Net profits of the company, before deducting interest charges amounted to \$9,776,873. After deducting interest charges the profits were \$7,868,223. Dividends to the minority stockholders in certain subsidiaries amounted to \$200,884. Dividends for the year upon the preferred and common stock amounted to \$6,945,388, leaving a surplus of profits of \$721,950, equivalent to about 2 per cent upon the common stock additional to the 6 per cent paid.

President Colt in his report to the stockholders stated that the company's policy had been to keep strong in cash, the item of about \$10,000,000 cash on hand representing over 50 per cent of the company's current liabilities outside of such as would of necessity exist in the transaction of its business.

JITNEY BUSINESS IS ACTIVE IN WIDELY SEPARATED CITIES

Jitney lines in Houston, Tex., are offering reduced fares. On the Montgomery line there are ten cars, called coupon cars, which are to give six rides for a quarter. A sign on the windshield will warn passengers that the cars are coupon cars, which means that with every fare paid a coupon will be given. Five coupons can be exchanged for one ride.

Philadelphia Men Start Jitneys

Residents of the northwestern section of Philadelphia have banded themselves into an organization to own and operate motor buses for their own benefit, and prominent Philadelphia business men in the central section of the city have formed a company capitalized at \$50,000 to introduce the jitney bus. In addition, several similar associations are in a formative state. These associations, like clubs, will not be for profit, will have no capital, being incorporated under the Act of 1874, members to pay dues and

contribute toward the upkeep and expense of the buses.

Several tentative routes have been mapped out that will take in the length and breadth of the city, and as business warrants, branch lines will be established connecting every important section of town with every other.

If present plans materialize several lines will be in operation by May 1.

Chinese and Negroes Must Be Carried

The Los Angeles jitney bus ordinance which has been hanging fire for several weeks, has been approved by the city council. The ordinance obliges drivers to post an indemnity bond of \$5,000 to protect passengers in case of accident. Persons of any nationality or race must be accepted as passengers. The Auto Bus Drivers Association made a hard fight on this point, but the council declared that the jitney bus, as a public utility, could make no discrimination against negroes and Chinese as passengers.

Legislation and the Jitneys

The relation of the jitney bus is so much of a divergence into new fields that the courts offer few precedents with which to light the way. The first decision, however, affecting the relations of the new carrier with the public has been handed down at San Diego, Cal., by Judge W. A. Sloan of the superior court. In an application to restrain the jitneys from operating on the streets of the city without a franchise the court denied the petition for an injunction, holding that in the absence of any physical appropriation of the highway the jitney is not subject to the franchise laws. The right of the legislature to enact a law giving municipalities the right to require franchises is not questioned. The court holds that the city has the right to regulate the jitneys by ordinance, and possessing that right the right to apply for an injunction does not adhere.

Selling Gas at Wholesale Price

Gasoline is selling for 10 cents a gallon at three filling stations in Portland, Ore., while most of the garages are charging 12½ cents a gallon. Garages complain that they are forced to pay 10 cents a gallon for the product at wholesale and they would lose money if they sold it close to that price because of overhead expense. At a recent meeting, 50 members of the Portland Garage and Repair Men's Association went on record for the establishment and maintenance of uniform prices of gasoline as well as accessories. This is a new organization, but it has already incorporated and is on a permanent basis, with H. C. Hess, president; J. H. Adams, first vice-president; Fred Dundee, treasurer; and Leland James, secretary. J. M. Rogers acts as business manager.



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When to Hold the Show

WHEN to hold the annual motor car show is of fully as much importance as the question whether to hold a show at all. The latter question has not received many negative votes since those days a couple of years ago when the shows were supposed to be dying and some would-be mourners prepared gates ajar and broken wheels for the funeral which never occurred. The corpse declined to act and has been very active ever since.

This question as to the best time to hold the show has been discussed in Boston, where the dealers in cars and trucks are this week staging one of the biggest shows of the year.

Consider All Factors

Here the discussion to an extent is whether it would not be better to hold the show earlier in the winter when the regular show season is in full swing; the Boston trade, however, has stuck by the early days of March as the time for its show and has acted wisely.

As every dealers' association should do in planning its show, the Boston association has considered every angle in the selection of its date. It has taken into consideration the climate, the conditions and movements in other trades, road conditions and other factors.

As March comes in—whether as a lion or a lamb—the New England roads are beginning to beckon to the car owner; the New England sun is beginning to throw an enchantment over that historic topography and the man who has not a car is going to want one shortly; there is a close connection between the show date and the opening of the touring season.

Boston is the center of New England, and at this season buyers from the country are making a pilgrimage to the Hub. Farmers and men of other occupations in the rural sections have time now to attend such a function; a little later they will be too busy, and a little earlier it is yet winter and travel is not pleasant. Everything considered, it is the most opportune time for the staging of a successful show in the New England territory.

Similarly, the dealers of other cities should consider all factors when about to stage a show; if certain agricultural or industrial conditions tend to interfere with the event, it is better by far to bend a little and yield to the conflicting elements; crowds of the right sort are the big element in the successful display; if planning can get them the planning is the transformation of thought into monetary results.

The Spot-light's Value

DOES getting himself or his car talked about pay the dealer?

If that is the end of it, No. If properly made a part of a plan, Yes.

There is great value in publicity and gathering of limelight, and two widely variant ways of handling it are exemplified at the Boston show. There are two exhibits—let them be nameless. Both are set up with the object of attracting attention; of themselves they can do no more. Neither one portrays any merit in the car, beyond showing it off, but both are the objects of comment.

In one exhibit there is sales efficiency; in the other there is not. In one visitors are taken care of; in the other they may wander aimlessly unattended. In one there is that cordiality which makes the visitor feel welcome; in the other, if he is greeted at all, it is with a lack of that which puts sunshine into his visit to the other space.

Getting publicity is a part of the plan of both; it is commendable in both. But while it is made part of a well laid plan in one it is a disconnected phase in the other; in the latter the set-up and comment lose their value through lack of coordination with efficient sales effort.

Motor World Guide Improved

BECAUSE of the insistent demand on the part of dealers, garagemen and repair-shop operators throughout the country it has been found necessary to somewhat enlarge the scope of Motor World Guide. This week it appears for the first time in its amplified form, the S. A. E. horsepower rating of every car having been added. This makes Motor World Guide of infinitely greater value inasmuch as it places before those who should be familiar with such facts additional information which will enable them to draw an intelligent comparison between the various cars listed.

PROMINENT MEN OF TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve to Place Many Workers in New Places—Few of Them Leave the Industry

E. B. Oscars has been appointed manager of the Goodyear Tire & Rubber Co., Indianapolis.

B. D. Parker has resigned as advertising manager of the Briscoe Motor Co., Jackson, Mich., and has returned to Detroit.

Howard S. Hamilton has been made manager of the exchange car department of the New York branch of the Locomobile Co. of America.

W. E. Finney, who has been connected with the Goodyear Rubber Co. for some years, has been appointed sales manager of the St. Louis branch.

H. H. Bierman has resigned as manager of the Springfield Buick Co., Springfield, Mass., and he has formed the Springfield Reo Co. with H. P. Gates.

W. C. Kenney has been appointed factory manager of the King Motor Car Co., Detroit, in place of T. A. Bollinger, who has resigned to go into business for himself.

A. J. Lavoie has been appointed manager of the Oxford Motor Car Foundries, Ltd., Montreal, Que. This firm is now manufacturing the new Maisonneuve motor truck.

Hanson Robinson has been appointed Philadelphia district representative of Dodge Bros., Detroit, to fill the position made vacant recently through the death of F. L. Jones.

R. C. Carr is the new special representative for the Kansas City Studebaker branch. Carr has spent over three years with the Oakland Motor Car Co. in Texas and Missouri.

H. H. Benjamin, who has recently been selling Federal trucks in the Kansas City territory, has identified himself with the Kansas City Studebaker branch and will cooperate with J. B. Clark as special representative.

T. C. Kirby has resigned from the management of the Montreal Automobile Trade Association, Montreal, Que., to accept the management of the Canadian Home Markets Association.

J. H. McDearmon, who has been with John Deere Plow Co., Kansas City, for eleven years, has resigned to become assistant sales manager with the Oakland Motor Co., Pontiac. McDearmon was assistant manager and sales manager of John Deere Plow Co. He started his career in the implement line with the

Kansas City Agricultural Implement Co., which, after a few years, consolidated with the Moline Plow Co. Later he was for a number of years with Deere-Mansur Co. He then left the implement business but returned to the John Deere Plow Co. in 1905.

Marion Officers Move to Jackson

The officers of the Marion Motor Car Co., Indianapolis, have made preparations to move their effects to Jackson, Mich., where the parts of Marion cars are being made by the Mutual Motors Co., a concern recently formed for the



J. H. McDearmon, just appointed assistant sales manager, Oakland company

purpose of building car parts for motor car builders. The moving of the general offices, together with the three main officers, J. I. Handly, Guy Monihan and Thomas Marshall, is made so as to bring the management close to the place of manufacture.

New Location for Marion

The Marion Motor Co., Indianapolis, has secured the four-story building at 430 North Capitol avenue and removed from its former location on Oliver avenue. The new building will house the general offices, engineering and service departments and the small manufacturing that will be done in Indianapolis. The principal factory of the company, which is allied with the Mutual Motors Co., is located at Jackson, Mich.

Waste Coming from Wisconsin

The Wisconsin Waste Co. has been organized in Milwaukee, Wis., to make a specialty of dealing in waste for garages, machine shops and factories. The office is at 228 Muskego avenue and warehouse at 256 Reed street. The owners of the concern are Harry E. Jacobs and L. D. Fisher.

9,000 VISIT FIRST SHOW BY BATTLE CREEK DEALERS

More Than 100 Cars Sold at Retail and Several Agencies Placed—To Form Car and Accessory Dealers' Association

The first automobile show ever held in Battle Creek, Mich., was closed Sunday night, March 1. Wednesday, February 24, was the opening day, and up to Friday night about 100 cars had been sold. The total number of visitors is estimated at from 8,000 to 9,000, or more than 2,000 beyond the show committee's estimate.

The out-of-the-city element may be stated to be 40 per cent of the total attendance. Many dealers from the nearby towns and villages came and several brought prospective purchasers with them. Without this show there is a possibility that they would not have made the sales.

One of the results of the show will be the organization of an automobile and accessory dealers' association. This was attempted a year ago, but no interest was shown by most of the dealers. Now it is different and they seem to realize that better results will be forthcoming by getting together and co-operating.

A few days before the show opened two new agencies were established. The Apperson cars are now handled by Ackley & Abbey and the Crow cars by H. E. Petrie, of the Independent Garage.

Herrmann Engineering Not Sold

Editor Motor World:

Our attention has just been called to an article appearing in our local paper, stating that the Herrmann Engineering Co. had been sold to the S. R. K. Motor Co. We wish to advise that at no time has the Herrmann Engineering Co. been negotiating with the S. R. K. Co. or any other firm with a view of selling out to them. Our business has been very satisfactory in the past and it is the object of the Herrmann Engineering Co. to sell the S. R. K. Co., as well as our large number of satisfied customers, motors. We are not planning to enter the car manufacturing field and expect to give everybody the same service as they have received in the past.

The Herrmann Engineering Co.,
Detroit, Mich. K. L. Herrmann

New Pullman Australian Dealer

The Pullman Motor Car Co., York, Pa., has just closed a contract with J. J. Hughes, of Sydney, for the sale of Pullman cars throughout the continent of Australia.

Bethlehem Show Big Success

Draws Visitors Within 60-mile Radius—Dealers Flock in and Sign Up Many Contracts

The Bethlehems and surrounding Pennsylvania towns gave enthusiastic endorsement and support to the first annual Lehigh Valley Automobile Show, which opened in South Bethlehem in the Coliseum on Monday and closed Saturday last week. The exhibit was a representative one in every respect, 71 cars being on view, divided among 57 dealers. Thirty-two different makes of pleasure cars, 7 different makes of trucks and 6 firms displaying many new accessories occupied space.

Success Was Unexpected

The daily attendance averaged between 1,000 and 1,100. Opening day being Washington's Birthday and a holiday to many in this region, the attendance was doubled, as it was the last day, when approximately 2,000 visitors were present. It being the first event of its kind ever held in the Lehigh Valley, the dealers holding aloof when first the idea was broached, its unusual success was entirely unexpected.

Occupying a conspicuous place on a platform in the center was a large silver cup to be awarded by the Lehigh Valley Show management to the dealer making the greatest number of sales during show week. The presentation will be made at a banquet to be given by the managers to the exhibitors this week. By reason of this competition an accurate estimate of the number of agencies established and total sales was not available, dealers preparing to keep all such information to themselves until the show was over. Then each will submit his aggregate, which must be sworn to.

Dealers More Than Satisfied

Every dealer claimed to have sold at least one car at the show, and Thursday four sales were registered in the afternoon by different dealers. So pleased are dealers with the results that wonder was expressed that the experiment was not tried years ago. Dealers were represented from South Bethlehem, Allentown, Easton, Nazareth, Bushkill Centre, Ackermansville and Philadelphia. As a direct result of the show more cars have been contracted for and more substantial prospects secured in the one week than in any previous period two or three times as long that could be selected for comparison. To avoid disappointment next year, three applica-

tions were registered for space at the 1916 show, for space will be limited. One year's successful experience behind them has proven to the promoters that the demand exists and next year the Coliseum will be enlarged.

Exhibitors to a man expressed surprise and gratification at the way the show "took," as the idea was attended by misgivings and doubt when originally suggested. Last winter when the dealers took the matter seriously it was discovered they were not the first in the field. An outsider had been through the valley, feeling the public pulse, and had planned to stage an exhibition at Allentown in the first three days of the week, which would have conflicted with the present show. Then it was that this

city got busy. A local show by local people was the slogan, and dealers in the surrounding territory became warmed up to the idea and cooperated to carry the plans to successful culmination. Consequently the Allentown project fell through.

The Lehigh Valley Show is now an established institution. This is a great automobile section and the inhabitants are just beginning to realize the benefits accruing from the publicity attendant upon the event.

Many Cars in Lehigh Valley

Visitors were present from a radius of 60 miles. It is claimed for the Lehigh Valley that there are more cars here in proportion to its size and population than in any other section of the country. Wealth, a picturesque surrounding country rich in historical lore, good roads, industrious people—many and varied are its attractions. The benefit to be derived from drawing transient and permanent guests is alluring, and it is the consensus of opinion that the motor car show just closed has done more than any other one thing to arouse a desire in the tourist to stop and afterwards to explore the country.

Fort Dodge Handles 30 Rich Counties

Fourth Annual Show Attracts 25,000 People From Radius of 100 Miles—Farmer Buyers Take Most of Cars Sold

The fourth annual Northern Iowa show, which was brought to a close in Fort Dodge, Ia., Saturday night, February 28, surpassed any other similar event in this section of the state, produced more business than many larger shows and attracted close to 25,000 people from a radius of 100 miles. Dealers are enthusiastic over the results obtained.

\$2,000,000 Business in 1914

In the heart of the only section in the country where business has been good for the past few months, according to a recent map of the United States Chamber of Commerce, Fort Dodge is the center of a section where people have money to spend for motor cars. Seventy-five per cent of sales are made to farmers.

Fort Dodge distributors handled \$2,000,000 worth of cars in 1914, and expect 25 per cent increase this year. All told, 30 counties in the prosperity belt are handled out of Fort Dodge. Five hundred fifty subdealers work under distributors and last year sold 2,500 cars and expect to sell 3,000 this season. Fort

Dodge now is recognized as the logical center for distribution in Northern Iowa. There were upward of 460 subdealers registered at the show.

From a sales standpoint the show was a success. Few notes were offered, most buyers tendering cash. Accessory men reported more sales than at Kansas City or Omaha shows.

The men who made the show a success are the dealers of the city. A. C. Heath, Fort Dodge Auto Co., is president of the Automobile Show Association; M. Q. Dally, Mitchell Implement Co., treasurer; George Tremain, Rankin Auto Co., secretary, and J. W. Smith, Cadillac Sales Co., vice-president.

Bigger Building to House Show

As the result of inadequate space in the 56th Regiment Armory, the dealers have started a movement to build a Coliseum at least three times the size of the armory. With the price of farm produce increased because of the war, Northern Iowa will produce big business from farmers this year. Land is increasing constantly in value and farmers are prosperous.

CHAMBER SETS DATES FOR MAY TRUCK CONVENTION

To Be Held in Detroit, May 5 and 6,
Following Directors' Meeting—New
York Show January 1 and
Chicago Show January 22

In addition to setting dates for the 1916 national shows, the National Automobile Chamber of Commerce at its last quarterly meeting, held in New York, also designated dates for a commercial vehicle convention. The New York show will open New Year's eve and the Chicago show will be opened January 22. The commercial vehicle convention will be held in Detroit May 5 and 6, following the regular monthly directors' meeting.

The commercial vehicle committee, of which Windsor T. White is chairman, is arranging to have important papers presented by men who are authorities on the various subjects and problems of the business, and each paper will be followed by discussion.

Evidence that the recent shows at the Grand Central Palace at New York and the Coliseum at Chicago broke all records for attendance and the amount of business done, was shown in the report of S. A. Miles, the show manager. There will be a 97 per cent return of the amount paid for space at the New York show and 83 per cent on the Chicago exhibition space, figures never before approached and made possible only by the extraordinary attendance.

Mason-Seaman Scores One

The Mason-Seaman Transportation Co., New York, gained an advantage in its fight against the amendment to the city ordinance which classes taxicabs and all vehicles equipped with taximeters as public hacks and makes them subject to the provisions of the original public hack ordinance. The advantage was in an order issued by the Appellate Division restraining the mayor and other city officials from enforcing the provisions of the amendment to the ordinance pending the determination by the same court of an appeal from the Supreme Court asking that the same restraint be placed upon the city officials until the constitutionality of the amended ordinance is settled.

The amendment to the ordinance classifying taxicabs as public hacks was passed by the Board of Aldermen on December 15, 1914. The Mason-Seaman Transportation Co. at once brought suit in the Supreme Court to restrain the city from enforcing the amendment until the test of its constitutionality was settled, but the justice denied the motion, and an appeal was taken on it to the

Appellate Division. The Appellate Division, not yet ready to decide this appeal, has said that the order asked for may be effective until the appeal is decided.

Connecticut Telephone is Expanding

The Connecticut Telephone & Electric Co., Meriden, Conn., is adding two stories to its present three-story building. This will make a building 50 x 100, five stories in height. The past year was the best the company has ever experienced and up to March 1, 1915, the volume of orders for ignition apparatus alone aggregates more than for any previous business covering a period of an entire year.

Scores on Broken Gasoline Contract

When the Standard Oil Co. of New York failed to deliver gasoline on William Haradon's contract, following an increase in price, the latter brought suit and has secured a verdict of \$2,322 against the oil company. The case was carried from the New York City Court to the Appellate Division, where the oil company was defeated in its efforts to upset the verdict.

Haradon, who operates two Royal garages in New York City, contracted April 24, 1912, for from 800 to 1,500 barrels of gasoline, and when the price was increased he demanded immediate delivery of an undelivered quantity of 1,100 gallons.

The oil company declined to deliver on the grounds that Haradon had no permit to store this amount and that to deliver it to him would be contrary to the city's ordinances; it also set up in defense an alleged nonpayment.

Haradon claimed he had arranged for the storage of all the gasoline he demanded and made tenable his position on the trial of the action. The amount he asked was the difference between 12 cents, the contract price, and 16 cents, the market price following October 17, 1912.

More Space For Haywood

The Haywood Tire & Equipment Co., Indianapolis, has just acquired the building adjoining its present location on North Capitol avenue and is fitting it up for immediate occupancy. The new building will give the company 10,000 square feet additional floor space and was made necessary by the increased demand for the Haywood company's vulcanizers.

Will Distribute Burd Piston Rings

Christman & Poole, 420-422 Jefferson street, Milwaukee, specialty distributors, has been appointed district sales agent for the Burd high-compression piston rings, his territory being the states of Wisconsin, Iowa, Michigan, Illinois and Minnesota.

CONSOLIDATED REFINANCED AND LEWIS IS MADE HEAD

Both Knapp and Palmer Resign Following
Addition of New Capital—
Practically All Dealers
Re-contract

The Consolidated Car Co., Detroit, organized in December to take over the business of the Abbott Motor Co., has completed plans for financing the business on a more extensive scale than originally was contemplated. New capital has been added and C. L. Lewis, of Toledo, and his associates have acquired control.

Lewis has been elected to the presidency and will go to Detroit in the near future to give all his time to affairs of the company. He is secretary and sales manager of the Edward Ford Plate Glass Co., Toledo, and is also a manufacturer of automobile parts and equipment.

A. C. Knapp and R. A. Palmer, who were members of the temporary organization, are no longer connected with the company. M. J. Hammers, D. E. Perry and F. E. Sangbush, who have been active in the management of the Abbott-Detroit business, will continue in like capacities with the Consolidated.

Practically all of the original Abbott-Detroit dealers and distributors have re-contracted with the Consolidated company.

The company is already producing the two models upon which it will specialize—a seven-passenger six-cylinder touring car, at \$2,290, and an eight-cylinder seven-passenger touring car, listing at \$1,885; the former has a Continental motor and the latter uses a Herschell-Spillman.

Gaulois Tire Prices Reduced

The Gaulois Tire Corp., New York, which has maintained its regular schedule of imports from France in spite of the war, announces a general reduction of its prices effective March 1. The 37 x 5 grooved rubber non-skid Gaulois hitherto sold for \$60.40 is now listed at \$47.95, while the 34 x 4 of the same type now sells at \$32.45 as against \$41.30. Inner tubes, steel-studded non-skids and all other types are proportionately reduced.

New Federal Minneapolis Home

Largely increased business in the northwest has caused the Federal Rubber Manufacturing Co., of Milwaukee, Wis., to plan a magnificent new home for its Minneapolis branch. The new building will be located at 1117 Hennepin avenue, and will be two stories in height, with a full basement. H. F. Bigelow is manager.

LOVELL-McCONNELL ADDS HAND KLAXONET FOR \$4

Has Horizontally Operated Lever from the Back and a Touch is Sufficient to Sound It—To Be on the Market May 1

The Lovell-McConnell Mfg. Co., Newark, N. J., has developed and will place on the market May 1, a new model of its hand-operated horn, styled Hand Klaxonet, which will sell for \$4. The horn operates on a new principle, the plunger projecting from the back rather than from the top. It is extremely easy in operation, the slightest touch sufficing to bring forth a warning signal. It is stated that already orders are in hand for nearly 10,000 of the new model hand horns.

Firestone Reduces Solid Tire Prices

The Firestone Tire & Rubber Co., Akron, O., has reduced the prices of its solid tires for commercial vehicles from 10 to 15 per cent, the new lists going into effect March 8. At the same time, all discounts have been eliminated and a net and dealers' list substituted for the previous list and several discounts. New prices on some of the more popular sizes follow: 36 x 2, \$12.60; 36 x 3, \$23.30; 36 x 4, \$35.10; 34 x 5, \$40.65. Other prices are in proportion.

Grossman's \$1,000 Prize for Sweepstakes

Swelling the list of prizes for the 500-mile International Sweepstakes Race which is to be run on the Indianapolis Speedway, May 29, the Emil Grossman Mfg. Co., Brooklyn, N. Y., has offered \$1,000 to the winner provided his car is equipped with Red Head spark plugs.

Detroit Office for Hammond

An office will be opened in Detroit by the Hammond Steel & Forging Co., Syracuse, N. Y. George De Sautels, recently with the Anderson Drop Forge Co., has been appointed western representative of the company in charge.

Edmonds Now Manufacturers' Agent

J. D. Edmonds has started in business as a manufacturers' agent, having taken quarters in the Ford building, Detroit. Edmonds was during the last three years representative of the Garage Equipment Co., Milwaukee, Wis.

Mayo-Knox Difficulties Settled

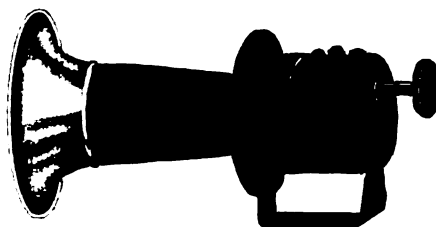
The late Alfred N. Mayo, former treasurer of the Knox Automobile Co., Springfield, Mass., was entitled to a commission of \$40,000 when he loaned to the company \$800,000 on eight \$100,000 notes.

He was justly entitled to an increase of his salary from \$12,000 to \$25,000 a

year, and did not unlawfully dominate the affairs of the company.

These are the findings in a review which referee in bankruptcy Charles W. Bosworth has filed in the United States district court in Boston in regard to disputed claims of the Mayo estate against the corporation. Aside from the \$800,000 the claims total \$117,000; the principal contested claims were the commission and the salary.

It was shown that the directors had the power to increase salaries and that they did this unanimously in August,



New hand-operated Klaxonet, which has horizontal plunger and sells for \$4

1911. Mayo was likewise given 53 preferred and 1,364 common shares for services to the company. As to the commission, it was held that this amount would have been paid had the loan been secured otherwise and that seven of the nine directors approved the action.

Motokart Makers See Trouble

A petition in bankruptcy has been filed against the Motokart Co., Inc., with offices at 1790 Broadway, New York. It is alleged by the petitioners that the company is insolvent and that it has made preferential payments and issued a statement of inability to meet its obligations.

More Space for Grant Cars

The Grant Motor Co., Findlay, O., has leased the plant formerly occupied by the Findlay Table Mfg. Co. and will use it to finish its cars. This increases the floor space by 40,000 square feet and will enable the building of 35 to 40 cars daily, or nearly double the output facilities.

Michigan Fender Offices in Detroit

The offices of the Michigan Crown Fender Co., Ypsilanti, have been moved to Detroit with headquarters in the Kerr building, East Fort street.

Timken Takes Metal Products

The Timken-Detroit Axle Co., Detroit, has purchased the plant, buildings and machinery of the Metal Products Co. It is understood that this plant will probably be devoted to the manufacture of the smaller sizes and types of axles.

Hexter Eastern Republic Manager

P. K. Hexter has been appointed eastern district sales manager of the Republic Motor Truck Co., Alma, Mich.

SPEEDWELL REFINANCING GETS TEMPORARY SETBACK

Court Appoints Receiver—Breach of Conditions Concerning Mortgaged Bonds Charged—Appraisers Named

Dayton, O., March 9—Acting on the application of the Dayton Savings and Trust Co., as trustee of the bondholders, Judge U. S. Martin, of the Common Pleas Court, on March 1, appointed Carl R. Green, mechanical engineer, receiver for the Speedwell Motor Car Co., under a bond of \$10,000.

Though the allegation is made in the petition that the company is in danger of insolvency, the proceedings are based on the charge of breach of conditions upon which the mortgaged bonds were executed. The bonds, totaling \$150,000, represent the bonded indebtedness on the plant, which is located in Edgemont, and in twenty-three city lots which are part of the company's assets, and all of the tools, fixtures, appliances, etc., exclusive of the accounts receivable.

C. D. Heald, chairman of the creditors' committee, which has been working on a proposition which it was expected would bring the company out of its financial troubles, expressed surprise over the action taken in court. The committee had proposed to the bondholders that they take up the merchandise claims against the company, amounting to \$60,000. Albert Pretzinger, E. T. Hall and E. E. Euchenhofer are named as appraisers.

New Detroit Office for Pennsylvania

The Detroit branch of the Pennsylvania Rubber Co., now located at 254 Jefferson avenue, will be moved to 804 Woodward avenue about April 1. This is the former home of the B. F. Goodrich Rubber Co.

Bridge Tax for Cars Proposed

A tax on automobiles and other vehicles using the East River bridges between New York and Brooklyn and Long Island City will be proposed at the next meeting of the Mayor's Tax Commission, which was appointed to devise new sources of revenue. It is estimated that a small tax would raise \$1,000,000 a year.

Renamed Detroit Ward Leonard

Hereafter the product of the Detroit Starter Co., Detroit, will be known as the Detroit Ward Leonard System for starting and lighting. It will continue to be manufactured in the plant of the Ross & Young Machine Co., Detroit. It is now manufactured under the Ward-Leonard patents.

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	S. A. E. Rating	Ignition	Carbureter	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT												
K	4-4½x5½	27.2	Spidf	Zenith	A-Lite	Disk	3	116	34x4	1,785	.....	.....
L	4-4½x5½	32.4	Spidf	Zenith	A-Lite	Disk	3	121	36x4½	2,085	.....	.....
F	6-3½x5½	33.75	Bosch	Zenith	A-Lite	Disk	4	130	35x4½	2,190	2,190	2,290
H	8-3 x5	28.8	Battery	Zenith	Remy	Disk	4	121	34x4	2,085	.....	.....
ALLEN												
34	4-3½x5	21.0	Walth	Stmbg	Walth	Cone	3	110	32x3½	885	885	.....
ALTER												
4-27	4-3½x4½	22.5	Remy	Holley	Remy	Disk	3	106	30x3½	685	685	.....
APPERSON												
4-40	4-4 x5	25.6	Elsmn	Rafid	Rijur	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	32.4	Elsmn	Rafid	Rijur	Band	3	120	36x4	1,685	1,685	.....
6-60	6-4½x5	43.5	Mea	Rafid	Rijur	Band	3	130	38x4	2,200	2,250	2,350
3-45	6-3½x5½	29.45	Elsmn	Rafid	Rijur	Band	3	122	34x4	1,485	.....	.....
ARBENZ												
1915	4-4½x5½	27.2	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,885	.....
ARGO												
Argo	4-2 5-16x4	8.5	A. Kent	Argo	.....	Cone	2	90	28x2½	285	.....	.....
AUBURN												
4-36	4-3½x5	22.5	.....	Rafid	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	29.45	.....	Rafid	.....	Cone	3	126	34x4	1,530	.....	.....
6-47	6-3½x5½	33.75	Bosch	Rafid	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN												
66	6-4½x6	48.6	Walth	Master	Walth	Disk	6	141	31x4½	3,000	3,000	3,900
BAUER												
B	4-4½x5	36.1	Mea	Shblr	Emmn	Disk	3	110	34x3½	875	1,000	.....
BRISCOE												
B	4-3½x5½	15.6	Spidf	.....	Apico	Cone	3	107	30x3½	785	185	.....
BUICK												
C-24-5	4-3½x3½	22.5	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	22.5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	33.7	Delco	Marvel	Delco	Cone	3	130	36x4½	1,650	.....	1,650
CADILLAC												
51	8-3½x5½	31.2	Delco	Own	Delco	Disk	3	122	36x4½	1,975	1,975	1,975
CARTERCAR												
9	4-3½x5	19.6	Delco	Shblr	Delco	Frn Trs	10*	33x1	.....	1,250	.....	.....
CASE												
75	4-4½x5½	29.0	Bosch	Rafid	Walth	Disk	3	120	35x4½	1,000	.....	.....
10	4-4½x5½	32.4	Bosch	Rafid	Walth	Disk	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	22.5	Walth	Stmbg	Walth	Disk	3	115½	34x1	1,350	.....	.....
CHADWICK												
19	6-5 x6	60.0	Bosch	Own	Walth	Band	4	119	37x5r	5,500	5,500	5,700
CHALMERS												
21-11	6-3½x5½	29.4	A. Kent	Rafid	Entz	Disk	3	125½	34x4½	1,650	1,72*	.....
M-6	6-4 x5½	38.4	Bosch	Rafid	Entz	Disk	4	132	36x4½	2,400	2,470	.....
32	6-3½x5	23.5	A. Kent	Rafid	G & D	Disk	3	120	34x4	1,400	.....	.....
CHANDLER												
15	6-3½x5	27.3	Bosch	Rafid	G & D	Disk	3	120	34x1	1,295	.....	.....
CHEVROLET												
H-4	4-3 11-16x4	14.4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	875	.....	.....
H-2	4-2 11-16x4	14.4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE												
4-40	4-4½x5½	29.0	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,865
6-51	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	48.6	Delco	Stmbg	Delco	Cone	3	134	37x5	2,465	2,465	2,465
8	8-3½x4½	30.2	Delco	Stmbg	Delco	Cone	3	126	34x4½	1,785	.....	1,785
CRAWFORD												
6-35	6-3½x5	29.4	Walth	Stmbg	Walth	Disk	3	120	34x4	1,850	1,850	.....
CROW												
E-42	4-4 x5	25.6	G & D	Shblr	Emmn	Disk	3	114	33x4	1,150	1,165	.....
E-52	4-4½x5½	32.4	G & D	Shblr	Emmn	Disk	3	120	34x4	1,475	1,600	.....
E-62	6-3½x5½	33.7	G & D	Shblr	Emmn	Disk	3	130	36x4	1,895	1,895	.....
C.E. Jr	4-3½x4½	15.6	Disco	Holley	Disco	Disk	3	104	30x3½	725	.....	.....
CUNNINGHAM												
S	4-4½x5½	36.1	Bosch	Stmbg	Undec	Disk	3	129	37x5	.....	.....	3,750
CYCLEPLANE												
Tour	4-2½x4	10.0	A. Kent	Own	.....	Disk	3	108	28x3	350	.....	.....
Trav	2-3½x4	9.1	A. Kent	Shblr	.....	.....	2	96	28x2½	250	.....	.....
DAVIS												
38-A	4-3½x5	22.5	Walth	Stmbg	Walth	Cone	3	112	34x4	1,235	1,235	.....
6-D	6-3½x5½	33.7	Bosch	Stmbg	G & D	Disk	4	128	37x4½	2,185	.....	.....
DETROITER												
C	4-3½x5	19.6	Remy	Stmbg	Remy	Disk	3	112	32x3½	985	.....	.....
8	8-2½x4½	24.2	.....	.....	.....	.....	.....	.....	.....	1,235	.....	.....
DILE												
A	4-2½x4	11.2	Bring	Holley	.....	Disk	3	96	28x3	485	.....	.....
DODGE												
...	4-3½x4½	24.2	Elsmn	Own	N E	Cone	3	110	32x3½	785	.....	.....
DORRIS												
1A-4	4-4½x5	30.6	Walth	Stmbg	Walth	Disk	3	121	36x4½	2,200	2,270	.....
DORT												
Four	1-3 x4	14.4	Conn	.....	Apico	Cone	3	.....	30x4	495	.....	.....
Five	4-3½x5	16.9	Conn	.....	Apico	Cone	3	.....	30x3½	680	.....	.....
DRIGGS-SEABURY												
C	4-2½x4	10.0	Mgnto	Zephyr	.....	Cone	2	100	28x3	385	.....	.....
A	4-2½x4	10.0	Mgnto	Zephyr	.....	Frn Trs	100	28x2½	385	.....	.....	.....
EMPIRE												
31-40	4-3½x4½	22.5	Remy	Holley	Remy	Disk	3	108	32x3½	975	975	.....
ENGER												
6-50	6-3½x5	29.4	A. Kent	Rafid	G & D	Disk	3	125	34x4	1,495	.....	1,495
FIAT												
35	4-130x170	42.2	Bosch	Own	Walth	Disk	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	44.0	Bosch	Own	Walth	Disk	4	135	37x5r	5,150	5,150	5,150
54	4-110x150	29.5	Bosch	Own	Walth	Disk	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS												
82-E	4-4½x5½	27.2	Spidf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	.....
80-E	6-4½x5½	40.8	Conn	Rafid	G & D	Disk	3	132	38x4	2,500	2,650	.....
FORD												
T	4-3½x4	22.5	Ford	Holley	.....	Disk	2	100	30x3	440	490	.....
FRANKLIN												
6-30	6-3½x4	31.5	Elsmn	Own	Dyneto	Disk	3	120	34x4½	2,150	2,150	.....
F. R. P.												
45-B	4-4 3-5x6½	33.8	Bosch	Stwrt	Bosch	Cone	4	110	30x4	All bodies to order	.....	.....
GLIDE												
30	4-3½x5	19.6	Walth	Shblr	Walth	Disk	3	114	32x4	1,195	1,195	.....
GRANT												
M	4-2½x4	13.3	Swiss	Mayer	A-C	Cone	2	90	28x3	425	.....	.....
T	6-2½x4½	20.0	A. Kent	Mayer	A-C	Cone	3	106	30x3½	785	.....	.....
GREAT WESTERN												
A	4-4½x5½	29.0	Kingstn	Kingstn	G & D	Cone	3	117	36x4	1,710	1,710	.....
R	4-3½x5½	22.5	Kingstn	Kingstn	Bosch	Cone	3	117	34x4	2,300	.....	.....
HALLADAY												
6-40	6-	.....	Walth	Stmbg	Walth	Disk	3	.....	34x1	.....	1,385	.....
HAYNES												
30	6-3½x5	29.4	Remy	Rafid	L-N	Disk	3	121	34x4	1,485	1,485	.....
31	6-4½x5½	43.5	Simms	Stmbg	L-N	Band	3	130	36x4½	.....	2,270	.....
33	6-3½x5	29.4	Remy	Rafid	L-N	Disk	3	127	35x4½	.....	1,550	.....
32	4-4½x5½	29.0	Simms	Stmbg	L-N	Band	3	119	34x4	.....	1,600	.....
HERFF-BROOKS												
4-40	4-4½x5	32.4	Bosch	Stmbg	Apico	Cone	3	118	34x4	1,100	1,100	.....
6-50	6-4 x4½	38.4	Bosch	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	.....
HERRESHOFF												
4-16	4-2½x3½	8.0	A. Kent	Carter	Dyneto	Cone	3	94	28x3	500	.....	.....
HOLLIER												
.....	8-3 x4½	28.8	.....	.....	.....	Cone	3	112	32x3½	.....	985	.....
HUDSON												
6-40	6-3½x5	29.4	Delco	Zenith	Delco	Disk	3	123½	34x4	1,550	.....	1,550
6-54	6-4½x5½	40.8	Delco	Zenith	Delco	Disk	4	137	36x4½	.....	2,350	.....
HUPMOBILE												
H	4-3½x5½	16.9	Bosch	Zenith	Walth	Disk	3	104	33x4	1,050	1,070	.....
K	4-3½x5½	18.2	A. Kent	Zenith	Walth	Disk	3	119	34x4	1,200	1,200	1,225
IMPERIAL												
64	4-3½x5	22.5	A. Kent	Stmbg	G & D	Disk	3	115	32x3½	.....	1,085	.....
56	6-3½x5½	37.7	Spidf	Stmbg	N E	Disk	3	130	36x4½	.....	2,250	.....
66	6-3 x5	21.6	.....	.....	.....	Disk	3	.....	33x4	.....	1,285	.....
INTER-STATE												
T	4-3½x5	19.6	Remy	Shblr	Remy	Cone	3	113	33x4	.....	1,000	.....
JACKSON												
46	4-4½x5½	32.4	Remy	Shblr	A-Lite	Cone	3	117	31x4	1,375	1,375	.....
48-6	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	125	34x4½	.....	1,650	.....
JEFFERY												
Four	4-4½x5½	22.5	Bosch	Rafid	U S L	Cone	4	116	34x4	1,500	1,500	.....
Six	6-3½x5½	37.7	Bosch	Rafid	U S L	Disk	4	133½	36x4½	.....	2,500	.....
Child	6-3 x5	21.6	Bosch	Stmbg	Rijur	Disk	4	122	34x4	1,650	1,650	.....
KEARNS												
L	4-2½x4	13.3	Bring	Zenith	A-C	Cone	3	109	28x3	550	.....	.....
KING												
.....	4-3 15-16x5	24.7	A. Kent	Stmbg	W. Lard	Disk	3	113	33x4	1,075	1,075	.....
.....	8-2½x5	24.1	A. Kent	Zenith	W. Lard	Disk	3	113	33x4	.....	1,350	.....
KISSEL												
4-36	4-4½x5½	29.0	Walth	Stmbg	Own	Cone	3	121	34x4	1,470	1,490	1,570
6-42	6-3½x5½	31.5	Walth	Stmbg	Kissel	Cone	3	125	34x4	1,650	1,650	1,650
6-48	6-4 x5½	38.4	Mea	Rafid	Kissel	Cone	4	132½	36x4½	2,350	2,350	2,350
6-60	6-4½x5½	48.6	Bosch	Rafid	Kissel	Cone	4	142	37x5	3,150	3,150	3,170
KLINE												
6-42	6-3½x5½	29.4	Walth	Rafid	Walth	Disk	3	123	34x4	1,750	1,770	.....
6-42-A	6-3½x5½	29.4	Walth	Rafid	Walth	Disk	3	127	35x4½	.....	1,850	.....

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KAT												
O	4-3½x4	22.5	Disco	Johnson	Disco	Disk	3 108	32½x3½	850	850	....	....
11	4-3½x4	22.5	Bosch	Stmbyg	N E	Disk	3 108	32½x3½	995	995	....	....
LAMBERT												
48-C	4-3½x4	22.5	Briggs	Shblr	Briggs	Frm Trs	112	32½x3½	....	1,200	....	....
68-C	4-4½x5½	27.2	Briggs	Shblr	Briggs	Frm Trs	117	34x3½	1,565	1,565	....	....
LENOX												
Four	4-4½x5½	29.0	Waths	Own	Waths	Cone	3 118	34x4½	....	2,000	....	....
Six	6-3½x5½	33.7	Waths	Own	Waths	Cone	3 130	34x4½	....	2,465	....	....
LEWIS												
VI	6-3½x6	29.4	Briggs	Stmbyg	Remy	Disk	3 135	36x4	1,600	1,600	....	....
LEXINGTON												
Four	4-3½x5½	24.2	Waths	Shblr	Waths	Disk	3 115	34x4	1,375	1,375	....	....
6-L	6-3½x5	29.4	Waths	Shblr	Waths	Disk	3 128	34x4	1,875	1,875	....	....
6-M	6-4½x5	40.8	A. Kent	Stmbyg	Jesco	Cone	3 130	36x4½	2,575	2,575	2,675	....
LOCOMOBILE												
M-5	6-4½x5½	48.6	Bosch	Own	Waths	Disk	4 140	37x5	5,100	5,100	....	....
R-5	6-4½x5	43.5	Bosch	Own	Waths	Disk	4 132	37x5½	4,400	4,400	....	....
LUVERNE												
700	6-4 x5	38.4	Bosch	Shblr	Jesco	Disk	3 128	36x4½	....	2,500	....	....
LYONS-KNIGHT												
K-4	4-4½x5½	32.4	Simms	Stmbyg	N E	Disk	3 130	37x5	....	2,900	2,900	....
MARION												
3-3½x4½	31.2	Bosch	....	G & D	Disk	3 115	34x4	1,500	1,500	....	....	....
6-3 x5	21.6	Bosch	....	G & D	Disk	3 122	34x4	1,350	1,350	....	....	....
4-3½x5	22.5	Bosch	....	Rafid	Disk	3 115	34x4	1,250	1,250	....	....	....
MARMON												
41	6-4½x5½	43.5	Bosch	Stmbyg	Bosch	Cone	3 132½	36x4½	3,250	3,250	3,350	....
48	6-4½x6	48.6	Bosch	Zenith	Both	Disk	3 145	37x5½	....	5,000	....	....
MAXWELL												
25	4-3½x4½	21.0	Simms	Kogatin	Simms	Cone	3 103	30x3½	725	725	....	....
McFARLAN												
T	6-4 x6	38.4	Waths	Stmbyg	Waths	Cone	3 132	36x4½	2,500	2,500	2,500	....
X	6-4½x6	48.6	Waths	Stmbyg	Waths	Cone	3 132	36x4½	2,900	2,900	2,900	....
MINTYRE												
25	4-3½x5½	19.6	Bosch	Stmbyg	G & D	Cone	3 106	32x3½	....	850	....	....
6-40	6-3½x4½	29.4	Briggs	Stmbyg	Briggs	Disk	3 120	35x4	....	1,275	....	....
MERGER												
Spdstr	4-3½x6½	22.5	Bosch	Zenith	U S L	Disk	4 130	34x4½	2,750	....	....	....
...	4-3½x6½	22.5	Bosch	Zenith	U S L	Disk	4 130	34x4½	....	3,000	....	....
METEOR												
32	4-4 x5	25.6	A. Kent	Stmbyg	Spdfr	Disk	3 114	34x4	....	1,075	....	....
45	6-3½x5	33.7	A. Kent	Stmbyg	Spdfr	Disk	3 126	35x4	....	1,395	....	....
METZ												
22	4-3½x4	22.5	Bosch	Own	G & D	Frm Trs	96	30x3	495	....	....	....
25	4-3½x4	24.2	....	A W T	G & D	Frm Trs	105	32x3½	....	900	....	....
MITCHELL												
Four	4-4 x5½	25.6	Conn	Rafid	Spdfr	Cone	3 116	34x4	1,250	1,250	....	....
Six	6-4 x5½	38.4	Conn	Rafid	Spdfr	Cone	3 128	36x4	1,585	1,585	....	....
7-4	6-4½x7	43.5	Remy	Rafid	Remy	Cone	3 144	37x5	....	2,350	....	....
7-6	6-4½x6	43.5	Remy	Rafid	Remy	Cone	3 132	36x4½	1,895	1,895	....	....
MOLINE-KNIGHT												
...	4-4 x6	25.6	Bosch	Shblr	Wagner	Cone	4 128	36x4½	2,500	2,500	2,500	....
40	4-3½x5	19.6	Conn	....	....	Cone	3 118	34x4	....	1,475	....	....
MONARCH												
Six	6-3½x5	29.4	A. Kent	Zenith	W. Lard	Cone	3 125	33x4	....	1,250	1,275	....
MONROE												
M-2	4-3 x3½	14.4	Conn	Zenith	A-Lite	Cone	3 96	30x3	460	....	....	....
MOON												
4-38	4-3½x5	22.5	Delco	Rafid	Delco	Disk	3 122	34x4	1,350	1,350	....	....
6-40	6-3½x5	29.4	Delco	Rafid	Delco	Disk	3 122	34x4	1,575	....	....	....
6-50	6-3½x5½	33.7	Delco	Rafid	Delco	Disk	4 130	35x4½	2,150	....	....	....
MORSE												
D	4-4½x5	34.2	Elsmn	Stmbyg	G & D	Disk	4 127	36x4½	3,600	3,600	3,600	....
NATIONAL												
AB	6-3½x5½	32.7	Elsmn	Rafid	Waths	Cone	3 134	36x4½	2,375	2,375	....	....
NORWALK												
F	6-3½x5½	29.4	A. Kent	Rafid	G & D	Disk	4 131	37x4	1,875	....	....	....
OAKLAND												
37	4-3½x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,150	1,200	....	....
40	6-3½x5	29.4	Delco	Johnson	Delco	Cone	3 123½	35x4½	....	1,685	....	....
Spdstr	4-3½x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,100	....	....	....
OGREN												
Six	6-3½x5½	33.7	Bosch	Rafid	B-Rahm	....	3	....	....	2,700	....	....
OLDSMOBILE												
42	4-3½x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,285	1,285	....	....
55	6-4½x5½	43.5	Delco	Marvel	Delco	Cone	3 139	36x5	....	2,975	....	....
OVERLAND												
90	4-4½x4½	27.2	Bosch	Shblr	A-Lite	Cone	3 114	34x4	1,050	1,075	....	....
91	4-4 x4½	25.6	Spdfr	Shblr	A-Lite	Cone	3 106	33x4	795	850	....	....
92	6-3½x5½	29.4	Bosch	Shblr	A-Lite	Cone	3 125	35x4½	....	1,475	....	....
OWEN												
...	6-3½x5½	33.7	Owen	Master	O M	O M	136	35x5	3,750	....	3,750	....
PACKARD												
3-38	6-4 x5½	38.4	Bosch	Own	Bljur	Plate	3 140	37x5½	3,750	3,750	3,850	....
5-48	6-4½x5½	48.6	Bosch	Own	Bljur	Plate	3 144	37x5	4,750	4,750	4,850	....
PAIGE												
Six	6-3½x5½	29.4	Bosch	Rafid	G & D	Disk	3 124	34x4	1,385	....	1,385	....
36	4-4 x5	25.6	Bosch	Stwrt	G & D	Disk	3 116	34x4	1,075	1,075	....	....
PARTIN-PALMER												
30	4-3½x4	15.6	A. Kent	Muir	G & D	Disk	3 96	28x3	495	....	....	....
38	4-3½x5½	22.5	A. Kent	Stmbyg	G & D	Done	3 115	33x4	1,075	....	....	....
PATERSON												
4-32	4-3½x5	19.6	Delco	Stmbyg	Delco	Cone	3 112	33x4	....	1,095	....	....
6-48	6-3½x5	29.4	Delco	Stmbyg	Delco	Cone	3 124	34x4	....	1,495	....	....
PATHFINDER												
...	6-3½x5½	33.7	Waths	Shblr	Waths	Disk	4 125	34x4½	2,222	....	2,322	....
PERLESS												
54	4-3½x5	22.5	A. Kent	Stmbyg	G & D	Disk	3 113	34x4	2,000	2,000	....	....
55	6-3½x5	29.4	A. Kent	Stmbyg	G & D	Disk	3 121	34x4	2,250	2,250	....	....
48-6	6-4½x6	48.6	Bosch	Own	G & D	Hand	4 137	37x5	1,900	....	5,000	....
PETER PAN												
3-E	4-2½x4½	12.0	Brng	....	....	Disk	3 110	29x3½	650	....	....	....
PIERCE-ARROW												
C-3	6-4 x5½	38.4	Bosch	Own	Waths	Cone	4 134	36x4½	4,390	4,390	....	....
B-3	6-4½x5½	48.6	Bosch	Own	Waths	Cone	4 142	37x5	4,900	4,900	5,000	....
A-3	6-5 x7	60.0	Bosch	Own	Waths	Cone	4 147½	38x5½	5,900	5,900	6,000	....
PILOT												
55	6-3½x5½	29.4	Waths	Shblr	Waths	Cone	3 126	34x4	1,885	1,885	1,985	....
75	6-4½x6	48.6	Waths	Carter	Waths	Cone	3 132	37x4½	2,985	2,985	2,985	....
PREMIER												
6-50	6-4 x5½	38.4	Elsmn	Rafid	Remy	Disk	3 132	36x4½	1,985	1,985	1,985	....
PRATT												
6-50	6-3½x5½	33.7	A. Kent	Rafid	G & D	Disk	4 132	37x4½	2,150	2,150	2,250	....
PULLMAN												
Jr	4-3½x4½	22.5	Spdfr	Stmbyg	Spdfr	Disk	3 110	30x3½	740	740	....	....
6-48	6-3½x5½	33.7	Simms	Stmbyg	Waths	Disk	4 134	36x4½	2,500	2,500	2,550	....
RAYFIELD												
20	4-2½x4½	12.0	A. Kent	Own	....	Disk	3 96	28x3	....	75	....	....
R-C-H												
K	4-3½x5	16.9	Bosch	B-D	W. Lard	Cone	3 110	32x3½	....	775	....	....
REGAL												
D	4-3½x5	22.5	A. Kent	Stwrt	Bosch	Cone	3 112	33x4	1,085	1,085	....	....
...	8-2½x4½	26.6	....	Stwrt	B-Rahm	....	113	33x4	1,250	1,250	....	....
...	4-3½x3½	18.2	....	....	Spdfr	....	3 106	30x3½	650	650	....	....
REMINGTON												
...	4-3½x4	15.6	A. Kent	....	W. Lard	Cone	3 104	30x3½	985	985	....	....
Glnd	8-3½x4½	31.2	A. Kent	Zenith	G & D	Disk	3 116	35x4½	1,495	....	....	....
REPUBLIC												

Motor Car Agencies Recently Established

PLEASURE CARS

CALIFORNIA		
Place	Car	Dealer
Glendale	Oldsmobile	E. Bennett, Jr.
COLORADO		
Colo. Springs	Pilot	W. W. Price
Denver	Pilot	Elmore Auto Co.
Montrose	Pilot	J. J. Hodges
Pueblo	Pilot	E. I. Crockett
CONNECTICUT		
Danbury	King	A. C. Penny
Derby	King	W. C. Gilbert
Hartford	Pilot	J. J. Molloy
New Haven	King	W. B. Moore
Shelton	Pilot	H. L. Stilphen
ILLINOIS		
Aurora	Pilot	E. J. Ellie
La Harpe	Pilot	B. N. Byler
Murphysboro	Pilot	G. E. Graine
Tuscola	Pilot	F. Wilson
INDIANA		
Farmland	Oldsmobile	Earl Burnworth
Huntington	Pilot	D. E. Lauferty
Indianapolis	Scrimps-Booth	E. H. Wilson
Indianapolis	Oldsmobile	Wildhack Co.
Logansport	Pilot	J. I. Barnes
Monon	Pilot	H. K. Rull
Muncie	Oldsmobile	Rowman & Shaffer S. Co.
North Vernon	Pilot	Litchfield Bros.
Tipton	Pilot	F. U. Campbell
Vincennes	Pilot	J. C. Hellert
IOWA		
Washington	Pilot	J. E. Griffith
KENTUCKY		
Duckers Station	Pilot	J. D. Smith
Shelbyville	Oldsmobile	Sol Hopkins
MAINE		
Caribou	Pilot	Pitcher & Briggs
MASSACHUSETTS		
Littletoncommon	Pilot	Thomas Moore
Lynn	Haynes	F. L. Witherell
Somerville	Pilot	E. O. Hayes
MICHIGAN		
Detroit	Ross	McKenney-Devlin Co.
Detroit	Chandler	Gordon Auto Sales Co.
Greenville	Maxwell	Hansen & Lyman
Houghton	Pilot	E. M. Hill
Jackson	Hollier	H. B. Crosier
Manistee	Chevrolet	National Car. & Sales Co.
Stockbridge	Dodge	W. Ostrander & C. Glenn
MINNESOTA		
Stillwater	Oldsmobile	L. C. Kriesel
MISSOURI		
Kansas City	Milburn	Electric Car Sales Co.
Kansas City	Regal	Myers-Eberol Motors Co.
Nevada	Pilot	W. F. Norman
MONTANA		
Brookville	Pilot	A. C. Miller & Co.
NEVADA		
Reno	Pilot	C. P. Burns
NEW JERSEY		
Collingswood	Pilot	J. T. Monaghan
High Bridge	King	G. H. Cramer
Jersey City	King	W. H. Dykeman
Newark	King	Stutz Motor Car Co., Inc.
Perth Amboy	King	Perth Amboy Hardware Co.
Trenton	King	J. R. McCardell & Co.
Westfield	King	Abrams & Sheld
NEW MEXICO		
Santa Fe	Pilot	N. Salmon
NEW YORK		
Brooklyn	Pilot	J. S. Frazee
Canajoharie	Pilot	W. J. Woser
Corinth	Pilot	J. I. Johnson
Dobbs Ferry	Pilot	P. J. Carpenter, Jr.
Elmont	King	Hoefner's Garage
Ferndale	Pilot	M. M. Schulz
Flushing	King	J. H. Seager
Katonah	King	Dickinson's Garage
La Grangeville	Pilot	W. J. Northrup, Jr.
New York	Pilot	J. E. Kunkely
Plattsburgh	Pilot	J. A. Lynch
Poughkeepsie	King	S. Sague & Son
Quogue	King	Louis Muley
Rochester	Pilot	Almy Auto Co.
Saranac Lake	King	The Shelley Tool Co.
Schenectady	King	L. A. Cunningham
Shelter Island	King	G. B. Wells
Tarrytown	King	Koenig Brothers
Troy	King	W. S. Wagar
Troy	Pilot	J. J. O'Hare
White Plains	Pilot	F. H. Briggs
Whitesboro	Pilot	J. H. Ownes & Sons
OHIO		
Akron	Pilot	O. R. France
Ashtabula Harbor	Pilot	G. H. Smith
Caldwell	Oldsmobile	Norval Robey
Columbus	Pilot	Pilot Auto Sales Co.
New Carlisle	Pilot	W. W. Morris
New Philadelphia	Pilot	S. S. Ufer
OKLAHOMA		
Elreno	Pilot	H. Townsend

OREGON		
Place	Car	Dealer
North Bend	Pilot	W. A. Davenport
PENNSYLVANIA		
Allentown	Pilot	M. H. Kemmerer
Bradford	Pilot	J. Rogerson
Coatesville	Pilot	Young Brothers
Corry	Pilot	W. E. Marsh
Dubois	Pilot	E. S. Criet
Easton	Pilot	M. H. King
Indiana	Pilot	J. L. Gulp
Jersey Shore	Pilot	R. M. Sallada
Kane	Pilot	G. E. Glatt
Masontown	Pilot	Masontown Motor Car Co.
McKeesport	Pilot	T. J. Ardinger
Mechanicsburg	Oldsmobile	H. J. Sheely
Minersville	Pilot	Ike Cohen
New Bedford	Pilot	F. X. Turgeon
Philadelphia	Pilot	Pratt & Moser
Pittsburgh	Pilot	Pilot Motor Car Co. of Pgh.
Portland	Pilot	E. P. Bogert
Sheffield	Oldsmobile	J. G. Cochran
State College	Pilot	M. B. Meyer
RHODE ISLAND		
Providence	Pilot	H. E. Bradford
TEXAS		
Corpus Christi	Pilot	W. A. Wakefield
El Paso	Pilot	W. L. Field
Plainview	Pilot	W. C. Wright
VIRGINIA		
Norfolk	Pilot	C. B. Cole
WASHINGTON		
Seattle	Pilot	Pilot Car Sales Agency
WEST VIRGINIA		
Wadestown	Pilot	J. O. Clark
Wheeling	Briscoe	Union Automobile Co.

Literature Received

Willys-Overland Co., Toledo. Catalog on new six—16 pages, 6¼ x 11½; three-color process on coated paper in gray-brown, corrugated cover stock. This is one of the most attractive catalogs which has appeared. The illustrations are of a high class; the center of the book is a four-page, folded reproduction of the complete car in wooded scenery. The illustrations are especially elucidating and serve their purpose well. The interior of the body, front and tonneau, is shown; the motor is clearly portrayed in detail; the vacuum system is pictured: the chassis cut is

accompanied by a keyed page; the rear axle construction is enlightening, and there are several good, small, detailed reproductions. The text is brief, to the point and just what a salesman or dealer wants to know.

The Nokolyd Signal Co., New York—This is an attractive little book, 4 x 6½, in two colors, with a rectangular perforation in the cover to permit the word STOP on the signal to show through. The signal is described concisely and well illustrated. There is a return post card attached inside the back cover.

Motor Car Securities Quotations

	March 6, 1914	March 8, 1915
	Bid	Asked
Ajax-Grieb Rubber Co., com.	200	250
Ajax-Grieb Rubber Co., pfd.	90	100
Aluminum Castings, pfd.	97	101
Chalmers Motor Co., com.	82	85
Chalmers Motor Co., pfd.	92	93½
Firestone Tire & Rubber Co., com.	288	295
Firestone Tire & Rubber Co., pfd.	108½	109½
General Motors Co., com.	74	75
General Motors Co., pfd.	83	83½
H. F. Goodrich Co., com.	22	23
H. F. Goodrich Co., pfd.	87	90
Goodyear Tire & Rubber Co., com.	120	127
Goodyear Tire & Rubber Co., pfd.	96	97½
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	5	5
International Motor Co., pfd.	15	15
Kelly-Springfield Tire Co., com.	130	140
Kelly-Springfield Tire Co., 1st pfd.	83	84
Kelly-Springfield Tire Co., 2nd pfd.	120	125
Maxwell Motor Co., com.	54	54
Maxwell Motor Co., 1st pfd.	27	28
Maxwell Motor Co., 2nd pfd.	9	9½
Miller Rubber Co., com.	155	160
Miller Rubber Co., pfd.	101	103
Packard Motor Car Co., com.	101	118
Packard Motor Car Co., pfd.	56	57
Peerless Motor Car Co., com.	38	40
Peerless Motor Car Co., pfd.	30	31
Portage Rubber Co., com.	40	44
Portage Rubber Co., pfd.	90	95
*Reo Motor Truck Co.	8	8½
*Reo Motor Car Co.	18	19
Stewart-Warner Speed. Corp., com.	57	58
Stewart-Warner Speed. Corp., pfd.	98½	100
Studebaker Corp., com.	23	24
Studebaker Corp., pfd.	70½	71
Swinehart Tire & Rubber Co.	70	71
T. S. Rubber Co., com.	60	60½
T. S. Rubber Co., pfd.	101½	102
White Co., pfd.	107	110
Willys-Overland Co., com.	88	89½
Willys-Overland Co., pfd.	92	96

*Par value \$10; all others \$100.



* Indicates sanctioned by A. A. A.

Mar. 14, San Francisco, Cal.—Panama-Pacific Cup Race, Exposition grounds.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.*

Mar. 20, Tucson, Ariz.—Road race, Borderland Automobile Club.

Mar. 23-28, Phoenix, Ariz.—Automobile-Architectural-Industrial Exposition; Armory.

April 20-22, Oklahoma City, Okla.—Road race, S. W. Auto Racing Assn.*

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.*

June 9, Galesburg, Ill.—Galesburg District Fair Association's 200-mile race.

June 19, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Assn.*

June 25, Sioux City, Ia.—Track meet.

July 3, Sioux City, Ia.—Speedway, 300-mile race, Speedway Assn.*

July 4, Tacoma, Wash.—Speedway races, Speedway Assn.*

July 5, Omaha, Neb.—Speedway races, Omaha Motor Speedway.*

July 9, Burlington, Ia.—100-mile track race, Tri-State Fair Assn.

July 31, Denver, Col.—Road race. Promoter, Chas. L. Newcomb, Jr.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 14, Janesville, Wis.—Track meet, Janesville Park Assn.

Aug. 20-21, Elgin, Ill.—Road races, Chicago Auto Club.

Sept. 6, Providence, R. I.—Speedway races. Promoter, F. E. Perkins.

Sept. 8, Kalamazoo, Mich.—100-mile track race, Kalamazoo Motor Speedway.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

THE SHOW CIRCUIT

Mar. 6-13, Boston, Mass.—Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Vehicle Assn.

Mar. 8-11, Johnstown, Pa.—Show; Auditorium Hall.

Mar. 8-13, Indianapolis, Ind.—Annual Spring Opening, Indianapolis Auto Trade Association.

Mar. 8-13, Des Moines, Ia.—Automobile show, Des Moines Automobile Dealers Association, C. G. Van Vliet, secretary.

Mar. 8-13, Utica, N. Y.—Utica Automobile Trade Association show.

Mar. 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers' Association. J. Clyde Myton, manager.

Mar. 22-27, Bangor, Me.—Automobile show, Auditorium; A. P. Pierce, manager.

MOTOR WORLD

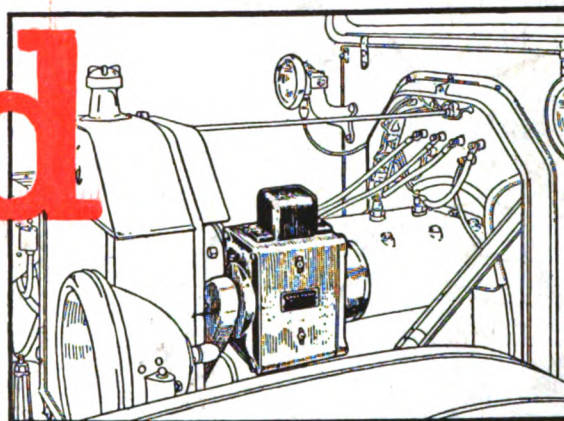
The Dealers' National Weekly

Volume XLII
No. 11

New York, March 17, 1915

Ten cents a copy
Two dollars a year

Ford



Here Is A System Built By Specialists

The Gray & Davis system for Ford cars is produced by an organization whose entire time and attention is devoted to building starting-lighting systems for automobiles *and nothing else*. The experimental work was accomplished long, long ago. The application of electric equipment to motor cars is not new to Gray & Davis. There are no mechanical and electrical problems to be solved at the expense of owners and dealers.

"GRAY & DAVIS" is pre-eminently *the system* to recommend. Full particulars to Ford dealers, supply men, etc., upon application.

GRAY & DAVIS STARTING - LIGHTING SYSTEM

Price complete \$**75**

Send for Catalog

Gray & Davis, Inc.
Boston, Mass.



"Republics give uninterrupted mileage under all road conditions!"
—says Old Man Mileage

On dry, rough, gritty country highways Republic Stag-gard Tread Tires speed along in smooth-running har-mony with the road. On smooth, wet city streets the long, tough studs of the Republic Stag-gard Tread grip with bull-dog tenacity, hold the wheels true to their course, minimize the danger of skidding and slipping.

Uninterrupted mileage—continuous ser-vice—safety—that is what counts in motoring.

Republic Tires and Tubes are the first choice of thousands of motorists who look for these things—of men who think thou-sands of miles ahead when they buy tires. They have learned that Republics are *Quality* tires, built as nearly trouble-proof as human ingenuity knows how.

Try a "find out" tire today. Write for "Old Man Mileage—His Book," which tells a lot you ought to know about tires.

THE REPUBLIC RUBBER CO., Youngstown, Ohio
Branches and Agencies in all the principal cities.

REPUBLIC TIRES
PLAIN, "WM"
AND STAGGARD TREADS

TRADE MARK REGISTERED
U. S. PATENT OFFICE

Republic Stag-gard Tread Pat. Sept. 16 22 1908



"Republics give uninterrupted sales mileage, too!"

Now running in the national magazines

Once a motorist tries Republic Tires he stops exper-imenting. Our dealers' records show that the vast majority of their business is **repeat sales**.

What better profit **assurance** could you ask for? Here is a tire so completely satisfactory that it builds up a **permanent** trade you can depend on—a tire that de-livers uninterrupted sales mileage.

Don't you think you ought to investigate? Write for detailed facts about the Republic proposition.

The Republic Rubber Co. Youngstown, O.

The HUDSON

of course, is one of the great cars whose makers have long recognized the superiority of tops covered with genuine

Pantasote



This is the type of metal label which we furnish manufacturers who equip with Pantasote—to let car **buyers** know the extra values they are getting with their purchase—in the longest wearing, highest grade and by far the finest looking top material ever devised—regardless of cost—**genuine** Pantasote.

Stiff and strenuous price competition has caused car manufacturers to “chop” wherever possible to keep production costs down. That is **all the more** reason for equipping with genuine Pantasote—to help keep **selling** costs down.

Top materials that absorb and hold dust, dirt or grease stains and leak when protection is most needed, that stretch and become baggy when they dry out, and fade in sunshine—**are sales killers!**

Genuine Pantasote, which withstands every change of weather conditions, stays **new** and keeps the car looking young—**is a sales builder!**

The Pantasote Company, 1704 Bowling Green Bldg., New York City

NEW DEPARTURE BALL BEARINGS

American Made for American Trade

Mean Economy to Both Motor Car Maker and User

Economy for the maker, because there is a New Departure Ball Bearing designed for use at every bearing point. Because by using the New Departure Double Row, where the big loads come, time and labor in assembling are economized and cost of installation reduced, as this dual purpose, single unit; carries both thrust and radial loads with equal efficiency.

Economy for the owner, because the ball type bearing, by eliminating friction, conserves power and correspondingly gives more miles per dollar expended for gasoline and oil, adds to the life of the car mechanism, and hence reduces up-keep cost to the lowest possible figure.

New Departure Ball Bearings do this throughout the life of the car itself because of their uniform quality and strength of material, and precision of manufacture and finish.

They have proved their reliability, durability and capacity for service, to the satisfaction of both manufacturer and car owner, in a large majority of

American-made models.

New Departure Ball Bearings are absolutely guaranteed.

Our Engineering Department will cooperate with the car builder in adapting this unexcelled, American-made bearing, to all parts of his car.

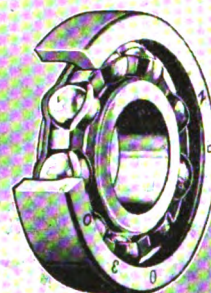
Write us today; our response will be prompt, complete and helpful.



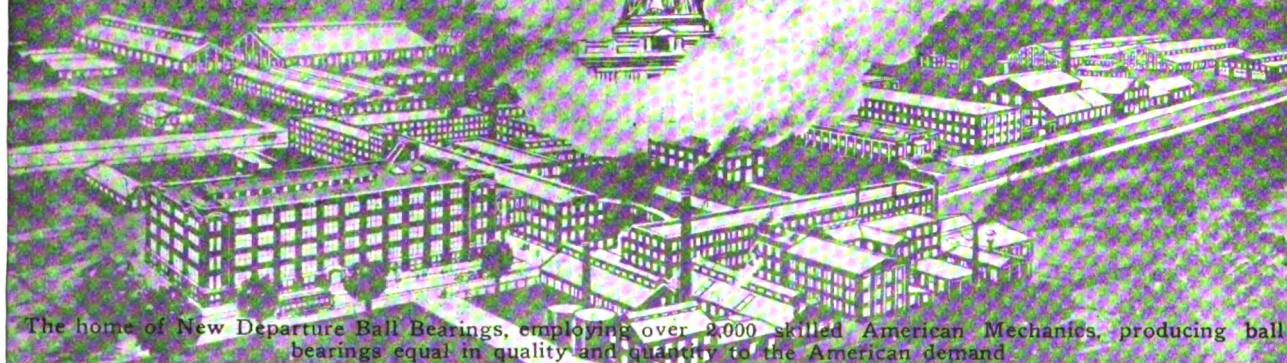
DOUBLE ROW
(Sectional)



SINGLE ROW
(Sectional)



RADAX
(Sectional)



The home of New Departure Ball Bearings, employing over 2,000 skilled American Mechanics, producing ball bearings equal in quality and quantity to the American demand.

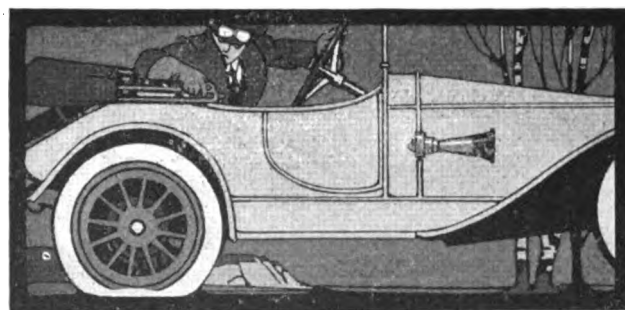
THE NEW DEPARTURE MANUFACTURING CO.,

Bristol, Conn., U. S. A.

Distributors in Trade
Centers throughout
the United States

Western Branch
1016-17 Ford Building
Detroit, Michigan

ADVERTISERS INDEX



Gone Flat Again!

No sharp report. Just the gradually perceptible jolting that tells of a leaky tube gone flat again. Hot, shadeless road and a dusty, dirty job.

That's the story of the needless puncture so common with cheap, machine-made tubes that leak around valves and become porous in service.

The way to avoid these unnecessary punctures is to equip your car with Kelly-Springfield Tubes, which are made *slowly and painstakingly by hand and out of real rubber.*

Kelly-Springfield Tires are made the same way. Use them with Kelly-Springfield Tubes and you will add increased tire mileage to freedom from needless tube trouble.

Send to 229 West 57th Street, New York City for "Documents in Evidence" which tells the experience of others.



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Three More—Far Reaching Advertising Influences—Added

Never before has there been such a tremendous advertising campaign.

Never before have dealers been given the help that Overland dealers are going to get this season.

In May, we add three more great publications to our advertising program. Every month, from then on, we will run an advertisement in colors in

Ladies' World The People's Home Journal Comfort

The combined circulation of these three publications is 3,150,000.

Most of this circulation is in small towns.

Thus we give direct practical help to our thousands of sub-dealers.

Handsome catalog on request. Please address Dept. 50.

"Made in U. S. A."

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, March 17, 1915

No. 11

New England Dealers Plan an Association

Meet in Boston and Plan to Bind the Organizations
of Six States in an Offensive and Defensive Unit

THE motor car dealers of New England, at a meeting last Thursday in Boston, took steps toward the formation of an association of the dealers of the six New England states. The meeting, which was called by the Boston Automobile Dealers' Association, by resolution voted to name a committee consisting of the representatives of city, county and state associations, which committee will meet later in Boston for the consideration of further plans.

At the meeting were association delegates who represented nearly 600 dealers; thirteen separate organizations appeared through members and the gathering was unanimous in its approval of the plan to bind the trade of the New England states into an offensive and defensive body. The states are Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut. The date for the meeting of the organization committee has not been set.

The association representatives who appeared are:

Rhode Island Automobile Dealers' Association, B. S. Clark; 41 members.

United Motor Industries of Rhode Island, Henry Corp. secretary, Providence; 80 members.

Worcester Automobile Dealers' Association, O. V. Tyler, secretary, Worcester, Mass.; 15 members.

Worcester County Automobile Dealers' Association, F. B. William, Worcester, Mass.; 60 members.

Hartford Automobile Dealers' Association, R. T. Taber, Hartford; 33 members.

Portland Automobile Dealers' Association, W. B. Thomas, Portland, Me.; 20 members.

New Bedford Automobile Dealers' Association, J. S. Coye, New Bedford, Mass.; 45 members.

Berkshire Automobile Dealers' Association, Albert W. Werkes and H. D. Sisson, Pittsfield, Mass.; 30 members.

Automobile Dealers' Association of Southeastern Massachusetts, E. A. Baxter, Hyannis, Mass.; 100 members.

New Haven Automobile Dealers' Association, Sherman Lee and W. A. Rutz, New Haven, Conn.; 36 members.

Automobile Dealers' Association of Vermont, J. B. Manley, Brattleboro; 35 members.

Boston Automobile Dealers' Association, Secretary Chester I. Campbell and President John H.

MacAlman; 44 members.

Springfield Automobile Dealers' Association, Carl H. Morton, Springfield, Mass. Membership not stated.

Total membership, 539. Besides these there were individuals from towns and localities which have no associations but are considering forming them.

One of the principal objects of the unifying of the New England dealers is the establishment of a defense against legislation which is aimed promiscuously at the trade; each state has its problems, and national

LEADING POINTS OF THE CONVENTION OF NEW ENGLAND DEALERS

- ☛ Delegates represented 539 dealers
- ☛ Committee named to further organization work
- ☛ Planned defense and offense in legislation
- ☛ Experience with recently proposed gasoline tax cited
- ☛ Used Car Central Market Report discussed
- ☛ Brooklyn representative told what his city has done

ASSEMBLY OF DELEGATES REPRESENTING NEW ENGLAND ASSOCIATIONS



1—Secretary Chester I. Campbell, of the Boston Automobile Dealers' Association. 2—J. W. Bowman, Boston. 3—President John H. MacAlman, of the Boston association. 4—J. S. Coye, New Bedford, Mass. 5—J. B. Manley, Brattleboro, Vt. 6—C. P. Rockwell, Boston.

7—James T. Sullivan, Boston Globe. 8—Alfred Cutler Morse, Boston. 9—Harry Fosdick, Boston. 10—V. A. Charles, Boston. 11—B. S. Clark, Providence. 12—Percival S. Clark, Providence. 13—F. A. Hinchcliffe, Boston. 14—A. S. Holly, Boston.

15—John H. Johnson, Boston. 16—E. A. Gilmore, Boston. 17—A. V. Reopell, Springfield. 19—Ray W. Sherman, and (20) Charles B. Shanks, Motor World, New York. 21—Henry Corp, Providence. 22—John G. Snyder, Brooklyn, N. Y.

legislation frequently enters into the situation, and in one instance at least the Boston dealers have endeavored to combat legislation for a state which is not properly organized. With an association of the whole section the machinery of the big unit would be available for concentration at any point where assistance were needed.

The dangers of lack of organization were emphasized by Secretary Chester I. Campbell of the Boston association, who told of that organization's recent efforts against the proposed national tax on gasoline and then on motor cars. He explained how the Boston association had sent telegrams to many cities and associations and had worked up a widespread protest against the tax. A representative of the Boston association also was sent in person to Washington and it was emphasized that his influence would have been much more potent had he gone as the representative of all New England.

John G. Snyder, a leader in the Brooklyn Garage Owners' Board of Trade, told of what organization had done for the trade in this portion of Greater New York. He explained oil and gasoline abuses which had been overcome through the purchase of a Board of Trade oil and gasoline in cooperative effort; the separator question, which has troubled both New York and Boston, has been overcome through the organizations in these cities.

President John H. MacAlman, of the Boston association, presided over the meeting, and in a brief opening address outlined what might be accomplished by an association of the New England division of the national motor car trade.

B. S. Clark, of Providence, spoke on the way the association he represented has handled the used car problem, mainly through educational propaganda and the use of the Used Car Central Market Re-

port of the Chicago Automobile Trade Association.

John H. Johnson, Boston; J. W. Bowman, Boston; J. S. Coye, New Bedford, Mass.; Henry Corp, Providence, and others commented briefly on the advantages they believed would accrue from organization.

These present were:

J. W. Bowman, J. W. Bowman Co., Boston
F. A. Hinchcliffe, New England Winston manager, Boston
Alfred Cutler Morse, Rolls-Royce and Renault, Boston
Harry Fosdick, Wentworth-Fosdick Co., Boston
V. A. Charles, Charles Motor Co. Boston
C. P. Rockwell, C. P. Rockwell, Inc., Boston
E. W. William, Bennington Garage, Bennington, Vt.
C. E. Silsby, St. Johnsbury, Vt.
Ernest E. Carrier, Ipswich, Mass.
J. S. Coye, Auto Selling & Supply Co., New Bedford, Mass.
O. V. Tyler, Worcester, Mass.
A. G. Frost, Portland Garage Co., Portland, Me.
A. M. Spear, Portland, Me.
W. R. Bliss, Goodyear Tire & Rubber Co., Boston
A. S. Holly, manager, J. C. Tucker Co., Boston
A. V. Reopell, Springfield, Mass.
Walter J. Norcross, Norcross-Cameron Co., Springfield, Mass.
George W. Wilcox, Weldon Garage, Inc., Greenfield, Mass.
J. L. McKone, Connell & McKone Co., Boston
Sherman Lee, Holcomb Co., New Haven, Conn.
M. A. Frank, Knight Tire & Rubber Co., Boston
M. H. Hazen, Hazen & Harrington, South Royalston, Vt.

G. H. Harrington, Hazen & Harrington, South Royalston, Vt.
Russell P. Taber, Hartford, Conn.
Percival S. Clark, secretary of the Rhode Island Automobile Dealers' Association, Providence
George S. Bearse, Chatham, Mass.
E. A. Baxter, Hyannis, Mass.
W. B. Thombs, Portland, Me.
G. E. Graham, Boston
M. R. Joy, Putnam, Conn.
Frederick N. Williams, Worcester, Mass.
J. B. Manley, Brattleboro, Vt.
H. F. Cutter, Barre, Vt.
J. H. Stuart, McIndor Falls, Vt.
S. R. Frye, Bath Automobile Co., Bath, Me.

Harry D. Sisson, president, and Albert Wurtz, secretary, Beck County Automobile Business Association, Pittsfield, Mass.
James H. Clark, Hardwick, Vt.
George A. Williston, Fall River, Mass.
James T. Sullivan, The Globe, Boston
A. A. Knapp, St. Johnsbury, Vt.
H. F. Davis, Fair Haven, Vt.
J. H. Johnson, Buick Boston Co., Boston
Ray W. Sherman, Motor World, New York



Walter Hicks, an attendant at the exhibit of the Chandler dealer, who distributed literature with as broad a smile and with as much enthusiasm on Saturday night as he did at the show opening

Boston Show Business Good

Trade Indicates Good Year Ahead—Dealers of All New England Make Sales

THE business done by dealers at the Boston show, which closed Saturday night, was such as to indicate a considerable increase this year in the car and accessory trade in New England as compared with that done during the past twelve months.

With the cars priced between \$1,000 and \$2,000 sales ran from one to two dozen and the volume of trade totaled from about \$15,000 to \$50,000; these figures are as good as or better than those of the 1914 show in individual instances and in the total are much better than for last year.

In the higher-priced cars, such as Packard, Pierce-Arrow and the two foreign cars, Renault and Rolls-Royce, the sales were, of course, fewer, being as low

as two and three in some cases, but the value total is higher and many prospects were secured. In the Cadillac exhibit one salesman said he had—up to Saturday afternoon—secured 250 prospects of his own, not counting those secured by the other salesmen.

The outside-of-Boston business is not a negligible feature; dealers from the other cities of New England make a practice of attending the show and many of them take a fixed position next to the aisle and watch for people from their home towns; many sales result from these meetings. In other cases prospects are taken to the show by dealers.

Contrary to the belief that the near-buyer is likely to be lost at a show and have his attention drawn to some other

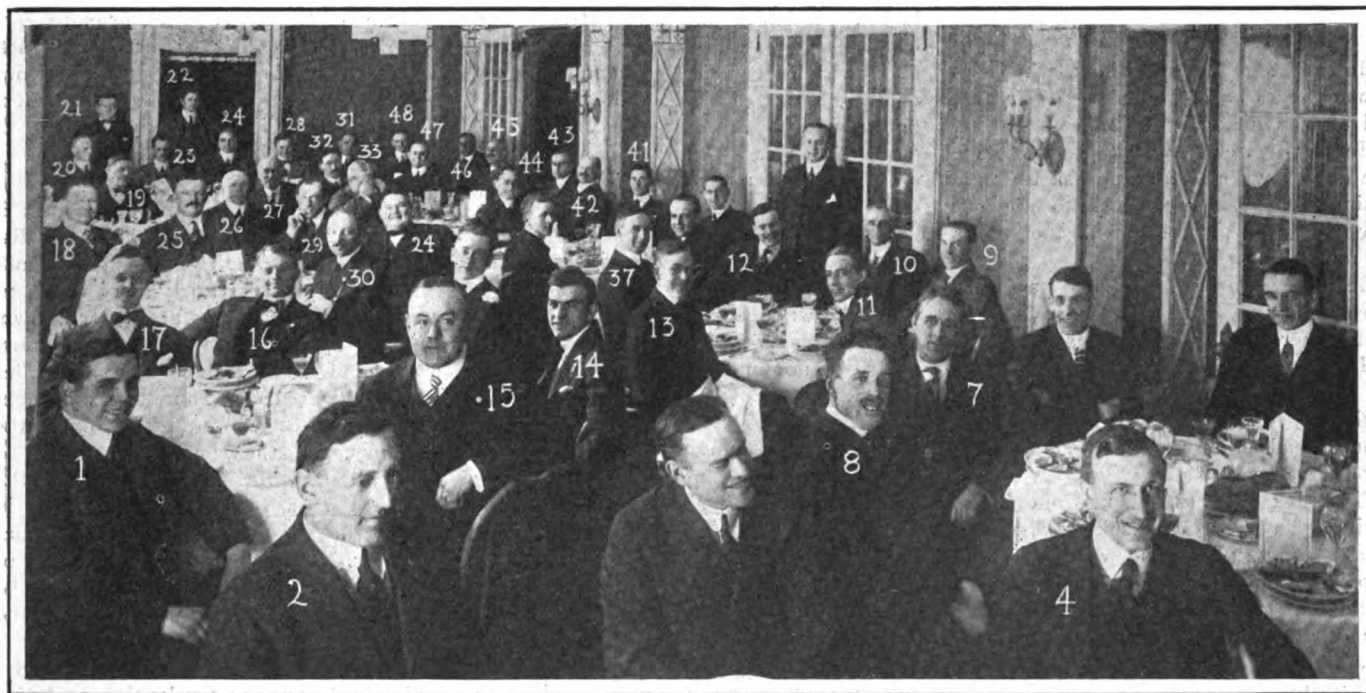
car, one out-of-town dealer stated that if the prospect is given a good impression of the car when at home the comparisons made at the show serve only to emphasize the advantages of the car on which he was originally a prospect.

In the accessory division there was more retail business than ordinarily develops at a show which has a national ranking. One tire tool exhibitor shipped 1,000 tools to his exhibit and disposed of the last one early Saturday evening—at \$1 each. J. O. Caldwell said Friday of this show that it brought more business than this accessory house ever had at any preceding show. And most of the sales were of small amounts.

The attendance was big; the press agent said 300,000 and the figure will probably be somewhere between that and 200,000; Friday night the show building was so congested that it was necessary to close the doors and let people out before more could be admitted; the street was packed in front of the building.

The big social event of the week was the Auto Round-Up Thursday evening at the Copley-Plaza, where 600 tradesmen sat down at 11 o'clock in the evening to a beefsteak dinner and cabaret.

BOSTON SHOW DINNER GIVEN TO CHALMERS DEALERS AT HOTEL LENOX



1—A. F. Bergeron, salesman, O. L. Blake, Keene, N. H. 2—Leon Sheldon, salesman, Norcross & Cameron, Springfield, Mass. 4—Jos. Norcross, Norcross & Cameron, Springfield, Mass. 7—Samuel Cass, dealer, Haverhill, Mass. 8—O. L. Blake, dealer, Keene, N. H.

9—Frank Kenney, dealer, Worcester, Mass. 10—D. P. Morris, salesman, Foster Smith Co., Providence, R. I. 11—G. L. Cutting, subdealer, Pollard Auto Co. 12—R. Parker. 13—M. H. Whittle, salesman, F. H. Henning Co., Worcester, Mass. 14—W. A. Lytle, salesman, Boston, Mass.

15—F. X. Coveney, salesman, Boston, Mass. 16—Ray Smith, demonstrator, Boston, Mass. 17—Earle F. Stockman, salesman, Boston, Mass.

18—George A. Wagg, dealer, Portland, Me. 19—James L. Welsh. 20—F. B. Coate, accounting department, Boston branch.

21—John Murphy, Boston Herald. 22—Harry Marden, Boston Transcript. 23—John Kerrison, Boston American. 24—Harry N. Pike, manager, Boston branch. 25—W. J. Skeehan, dealer, Augusta, Me. 26—A. A. Mills, dealer, Pittsfield, Mass. 27—F. L. Caulkins, dealer, Middletown, Conn.

28—Frank Willis, eastern district manager, Chalmers Motor Co. 29—Dana Plumber, salesman, Maine Motor Car Co., Portland, Me. 30—F. D. Brannan, salesman, Boston. 31—Percy

Owen, sales manager, Chalmers Motor Co., Detroit. 32—M. Eddy. 33—H. S. Chase, salesman, Nashua, N. H.

34—John J. Hogan, dealer, Lowell, Mass. 35—W. A. Cahill, salesman, Boston. 36—S. B. Jacobs, salesman, Boston. 37—M. Putney. 41—Edward Tewhart, demonstrator, Boston. 42—A. C. Pollard, dealer, Nashua, N. H. 43—F. P. Allen, sales manager, Boston.

44—Ralph Height, dealer, Somerville, Mass. 45—M. Gardiner. 46—Lee Councilman, Detroit. 47—Arthur L. Rogers, salesman, Pittsfield, Mass. 48—Lee Olwell, general manager, Chalmers Motor Co., Detroit.

Who Will Be the Truck Dealers of 20 Years From Today?

Sales and Service May Be on a Basis Akin to That of Farm Machinery of Today, Say Truck Merchandising Experts

When John Hardwood, who runs a lumber business up in East Montpelier, Vt., wakes up twenty years from this morning and realizes that he can use a motor truck in his business, where is he going to get it?

There is no question but that he will be able to get it; the truck is here to stay and is going to be sold in greater volume than ever. The question is: Where will John Hardwood get the truck?

He might do any one of several things. He might walk down to Joe Smith's garage and ask Joe, who is an exclusive truck dealer, to trot out that 5-ton demonstrator and see how sprightly it could step along with a pile of boards on its back.

Several Buying Methods

He might go to Bill Black, who sells pleasure cars with trucks as a side-line, and start a dicker with Bill.

He might wend his way to an office in a downtown building and ask the man behind the flat-topped desk to dig out blueprints and pictures of all the trucks the man represented.

He might drop into Blevins' hardware store and inquire casually what Blevins could offer in a 5-ton proposition.

He might do a whole lot of things, but the question which has not yet been settled by the men who make and distribute trucks today is what John Hardwood really will do.

The truck dealer problem is one which is vital today with the truck makers; and it is no less a problem with the men who would like to be truck dealers and would like to gather in profits from the sale of commercial vehicles but haven't been able to figure out a way to do it with profit.

At the truck show last week in Boston the factory men who were present with truck exhibits—from parcel cars to 10-ton tractor-trailer outfits—were assertive in stating that the selling of trucks is vastly different from the selling of pleasure cars, and that it is not unlikely that the selling of trucks through dealers may in the future develop a plan of merchandising far different from that in the popular conception today.

Some of them stated that there may

never be in the truck field regular dealers such as handle passenger vehicles at the present time; some of them predicted a revamped system of distribution which will involve centralization in big cities with a selling system of a new type.

One analogy drawn was that trucks—which are nothing more than pieces of machinery—will be sold on the same basis as farm machinery, and that the demonstrating and service will be closely allied to the implement selling and service system in nature.

Farm Machinery Basis

The one big obstacle in the way of merchandising trucks on the pleasure car basis is the cost of the vehicle; whereas almost any dealer—large or small—can buy a passenger car demonstrator and be satisfied with his own personal use of it even if he doesn't sell more than a couple of cars, the dealer who essays to handle trucks the same way will lose money. He cannot buy a demonstrator unless he is in a town where the volume of business warrants it.

Also, the sale of trucks is and will be out of all proportion to the sale of pleasure cars in any locality; where there are 100 men who can and will buy touring cars or runabouts in a year, there are probably not more than a dozen who will buy trucks. Therefore, the dealer who depends on truck selling for a livelihood in a small town has planned faultily; he cannot depend on that alone; he must have other business.

Light Truck Distribution Different

With light delivery cars the situation is quite different, but still not akin to the pleasure car trade. Only business men want commercial vehicles, while any man with the price is a pleasure car prospect.

The prohibitive price of a demonstrator truck and the restricted sale tending to make truck dealing on a pleasure car basis unattractive to the dealer, there enters the problem of how to do it—for it must be done.

At present the truck trade in New England is handled in a way which may be the foundation for the truck distribution of twenty years hence. This applies, of course, to the big, heavy vehi-

cles which are out of the light delivery class—the 3-, 5- and 10-ton types.

While the plan differs in detail in almost every instance the makers of big trucks do not depend upon dealers for their business. With some of them a branch is maintained in Boston only; others have branches in several other cities, such as Portland, Me., Providence, R. I., and Springfield, Mass., and from these centers the business is conducted without dealers.

If a prospect is secured through inquiry or a tip, a salesman is sent to see him; sometimes a demonstrating truck will be sent far out into the country to make a sale and give that truck a start in that territory. The work is all handled from the branch and without dealer assistance. In the case of pleasure cars the Boston branches or distributors sell cars to dealers all over the territory and depend upon the dealers to sell them in turn to the ultimate buyers.

Branch House System Faulty

This plan eliminates the dealer, but it has a fault in that the branch or distributing house is not in sufficiently close touch with the territory; there are hundreds of prospects who are never known. With a representative on the spot many of these would be unearthed and sales might be increased. Some of the branches keep salesmen traveling over the territory, but these men can never be so familiar and in so close touch with the territory as a resident of the town in which the prospect lives. This situation creates a need for a truck dealer of some sort. The problem which will be worked out is, Who and what shall he be?

In the case of a manufacturer who builds both cars and trucks the car dealer is able to get some truck business; sometimes he gets it alone and sometimes with the cooperation of the distributing house or branch. But where a maker builds trucks alone he has no such array of car dealers upon which to depend.

As to the on-the-spot representative of the truck company, several types were suggested by truck makers, but all agreed that the distributor in the big cities would always be the key to the plan. Without a demonstrator, selling, they said, would

be from catalogs and blueprints or from the work of trucks already in service in the community where the prospect resided.

The on-the-spot sales work may be in the hands of a representative who has only an office; it may be turned over to a hardware or implement man, or it may be given to a car dealer.

Trucks Sold by Blueprints

The representative with an office and no salesroom or demonstrator and who shows only blueprints and photographs is considered by several the ultimate truck dealer; some have given consideration to the hardware man because he sells a line of goods which is needed by the man who needs a truck and therefore would be quite likely to be in touch with the needs of that trade. He also could stock some parts. The office representative would stock no parts.

Placing the agency with the pleasure car dealer meets with the least favor in the consideration of the ideal truck merchandising plan.

The truck and the pleasure car, sales managers stated, should not be sold by the same man; the product and its uses are too variant for the success of this dual role.

Three phases enter into the situation:

1—Personal, or verbal, work.

2—Demonstrating.

3—Service; taking care of the sold vehicle.

Considering first the sales work of the truck dealer or salesman, truck men aver that their vehicles require a dealer of a different type from the pleasure car man. They state that many pleasure car dealers are not sufficiently capable to handle the sale of trucks. It may be that some of these dealers are good pleasure car men and that the difficulty is that they are treading on unfamiliar ground, which is the basis for the assertion that the successful truck dealer must be a different type of man.

That the work is harder will perhaps be conceded; the situation was well summed up by a man who specializes in one- and two-ton trucks; he stated that the man whose name is entered on the pleasure car dealer's prospect list is already sold on the car question; he wants a car. Nearly everyone today wants a car, and if the man has means enough all that is required is that the dealer sell the prospect the particular car the dealer is handling.

Must First Sell A Truck

In the truck field today it is different; the truck salesman generally has first to sell the prospect on the whole truck question. He must first convince the prospect that a truck is a good thing; then the salesman, having sold A truck must sell HIS truck. It is a double sales work. He is first a general truck

missionary and next a salesman for his own line of trucks. After the missionary work is done the man is just as much a prospect for one truck as for another.

This is one reason why truck men say it requires a more capable dealer; pleasure cars, they maintain, are easier to sell than trucks.

Another qualification is that the salesman should also be a traffic engineer; he should be able to analyze the business of the prospect and tell him whether a truck can be of value in his business, and what size or style of truck. He should also be truthful and not sell the prospect something he does not need. This selling of trucks in places they were not needed—either through the ignorance or craftiness of the salesman—is one of the things which has damaged the truck industry. It has given it to a certain degree a black eye.

Great diplomacy is required in the handling of traffic data; one truck man stated that he liked to familiarize himself with the details of a prospect's business and then go to the prospect and show him where a truck could be of value; but there is a drawback to this in the pride and confidence of the prospect. He has built a successful business without the advice of the truck salesman—traffic expert and resents having a stranger walk in and attempt to tell him how to run his business. To sell the prospect on the general truck question he must, however, be shown these figures, and how to do it to greatest advantage is a question this truck man said he had never solved.

Service a Stumbling Block

A stumbling block in the path of the man who sells trucks is the truck buyer's erroneous idea of service; he has fallacious ideals and has been given a harmful education in service through his experience with the pleasure car. He buys a car and if he has trouble runs down to the dealer and asks for help; sometimes he gets so much help that bye and bye the dealer isn't there any more to help him.

Then, this same man buys a truck, and he still expects to receive what the pleasure car industry has given as service. If he has trouble he wants to hasten to the dealer who sold it and be helped out of his difficulty, but under the truck merchandising plan—of now and the future—this cannot be done. The truck dealer cannot carry a stock of parts; it is too costly.

Service must be rendered by the branch or distributing house. If a part breaks it can be secured only in Boston or the next nearest branch; the truck owner wires for it and it is sent to him or a service man takes it to him and repairs the job.

And it is maintained that this should constitute satisfactory service; the farm-

er does the same thing with his self-binder, so why should not the lumberman with his truck? If a wheel breaks on the self-binder the farmer lays the machine up until he can have another wheel rushed out from town; then he puts it on himself or gets a capable mechanic to do it—and he accepts this as satisfactory service. Therefore, why should not the truck owner do likewise? He should, say the truck men; all that is required is the right sort of education. He has been wrongly educated and must be started all over again—away back in the kindergarten.

Farm Implement Service Plan

In some territories where the central point is remote from some owners, service men could be maintained in the principal towns for the rendering of speedy service. This man would also be a semi-salesman and report to the office all tips received on possible sales. This is done to a certain extent at the present time.

Just as the farmer gives himself much of his own service with his self-binder, Preston T. Miller, a truck dealer in Springfield, is educating his owners to do this same thing; he maintains no service plant or salesroom and with his present equipment could not give service if he wanted to—which may be one of the reasons he is succeeding in his policy.

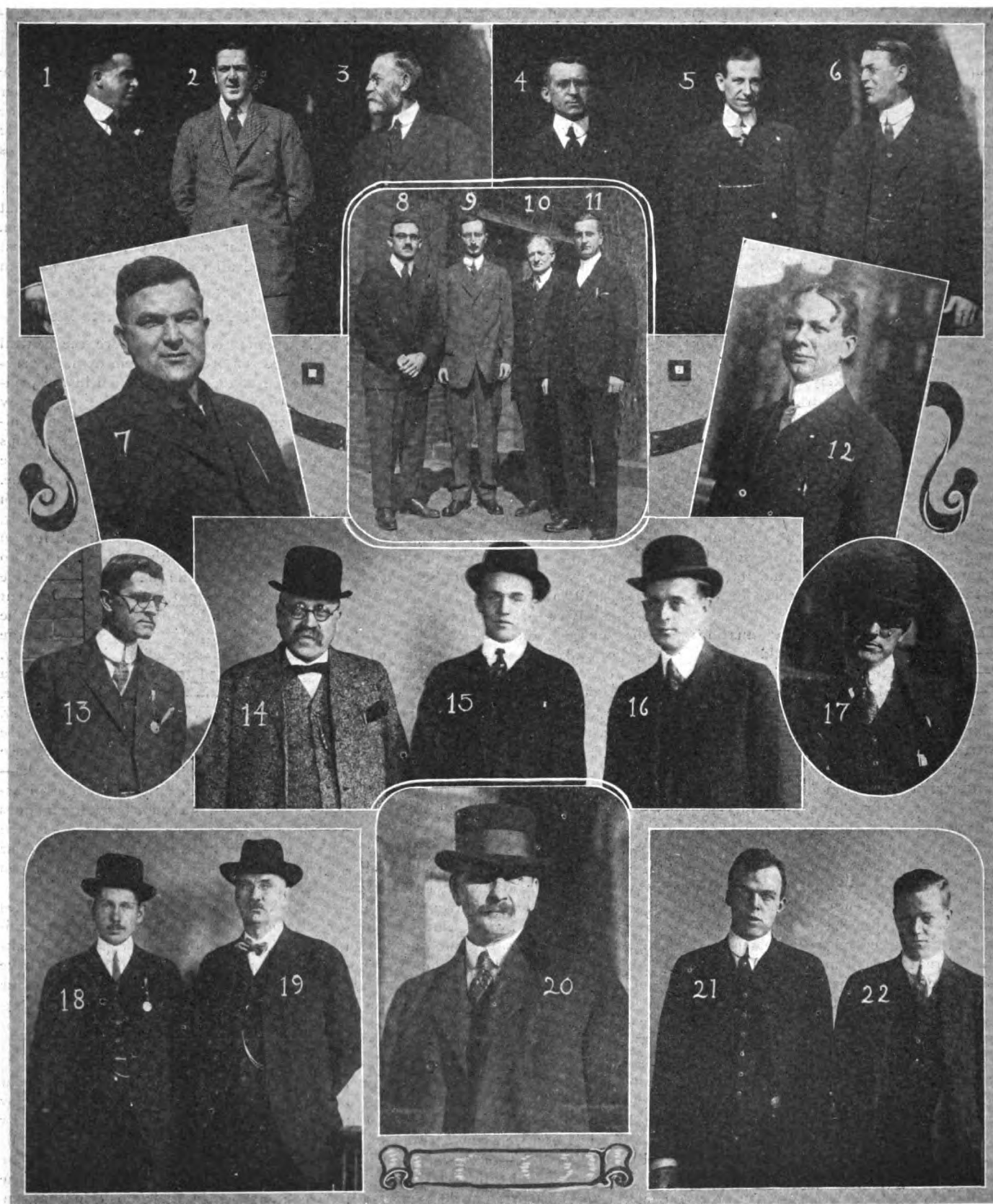
And the used truck business will be a fruitful trade in cities of sufficient size, according to P. A. Borton, Worcester, Mass., who handles the I. H. C. He states that since commercial cars are bought for service and not for looks—an element which enters into the pleasure car sale—the commercial car does not depreciate so rapidly as does the pleasure car the first year or two. The truck, he says, will sell on what it can do, not on how it looks.

He deals in used trucks of all makes and finds the greatest demand for vehicles of one- and two-ton capacity. Trucks whose makers are firmly established have a preference, and used vehicles of the one-ton and two-ton capacities are eagerly snapped up.

Dealer Must Carry Paper

Borton states also that the truck maker must carry much of the paper taken by the dealer; business houses will not draw money out of the business to pay for this equipment, and paper therefore must be accepted. Borton also agrees with the truck makers in their position that the heavier vehicles are a difficult proposition for the dealer.

The truck situation in New England and the opinions of the New England manufacturers and distributors are applicable to the whole country. The truck industry may be said to have been born in this territory and many truck problems here are as advanced as in any other section.



1—J. Franklin Brown, Dunlap-Brown Oil Co., Boston. 2—W. G. Winslow, president, Winslow Lubricating Co., Buffalo. 3—H. C. Fuller, Lowell, Mass. 4—Edward Gonia, and (5) W. F. Baker, of Gonia & Baker, a new Graphin oil distributing agency in Rockland, Me.

6—W. H. Jaques, Winslow Lubricating Co., Manchester, N. H. 7—John V. Welton, John V. Welton Co., manufacturers' representative, Boston. 8—Clifton S. Dunlap, Dunlap-Brown Oil Co., Boston. 9—E. W. Hagamaier, head of Re-

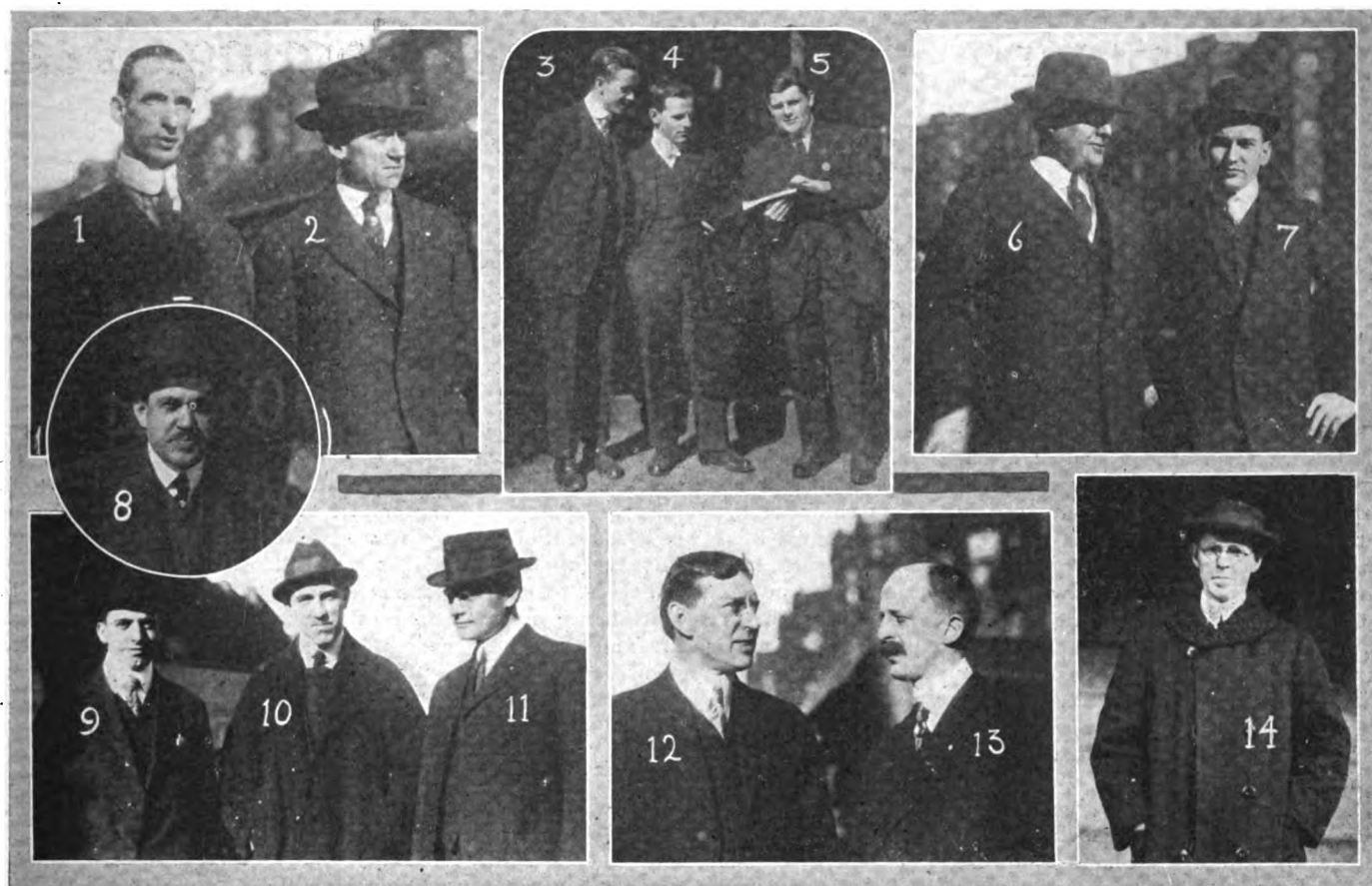
search Department of the Winslow Lubricating Co.

10—C. J. Horan and (11) Fred E. Robinson, salesmen, Dunlap-Brown Oil Co. 12—Charles A. Jackson, Boston; distributor of Thurber air starters and of J. M. shock absorbers, and maker of K P foot-rest heaters and Jaxon lighting systems. 13—Reuben Hilt, Boston; vice-president of the G. H. Dyer Co., Boston.

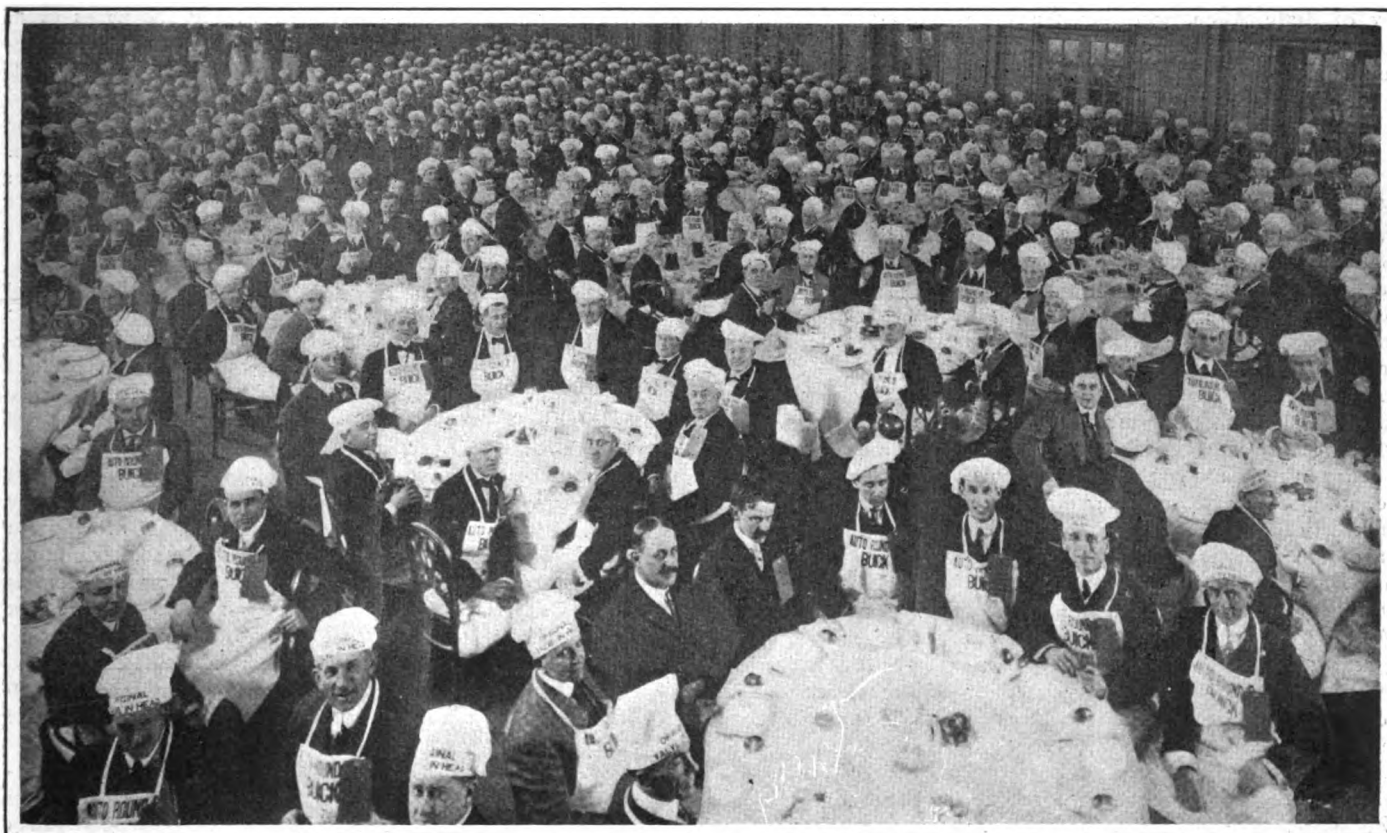
14—John O. Caldwell, Sr., manager of Boston branch of the Voorhees Rubber Mfg. Co., of

Jersey City, N. J. 15—G. W. Clement, Boston representative of the Puritan Soap Co., of Rochester, N. Y. 16—John O. Caldwell, Jr., Boston supply dealer. 17—George M. Dick, one of the proprietors of the Oulford Sales Co., Boston.

18—Albert Lunnemann, sales manager of the Martin & Huneke Co. 19—Carl J. Willenborg, engineer, Martin & Huneke Co., New York. 20—W. H. Clapp, manager of the Automobile Clothing Department of Scott & Co., Boston. 21—R. L. Corey and (22) F. R. Smith, Corey & Smith, Worcester, Mass., supply distributors.



THE AUTO ROUND-UP AT THE BOSTON SHOW. It was held Thursday evening at the Copley-Plaza; 600 tradesmen attended



FOURTEEN BOSTON ACCESSORY AND SUPPLY DEALERS. 1—G. S. Craven, special representative, and (2) W. T. W. Underwood, Boston manager, Miller Rubber Co. 3—Arthur Hall, Jr., sales representative, C. F. Atherton, Inc. 4—C. F. Atherton, of C. F. Atherton, Inc., supply distributor. 5—F. E. Covell, Taunton,

Mass.; Bristol county representative of C. F. Atherton, Inc. 6—W. A. Prince, sales manager, Harvard Storage Battery Co., Cambridge, Mass. 7—John A. Selee, sales representative of Harvard company. 8—R. T. Green, Green & Swett, Boston. 9—W. B. Kendall, sales manager, Westing-

house Air Spring Co., Boston branch. 10—H. G. Davis, New England manager, Westinghouse Air Spring Co. 11—Henry F. Knapp, Knapp Motor Car Co., Lebanon, N. H. 12—J. D. Coward, Coward Auto Supply Co., Boston. 13—W. B. Adam, sales representative, Coward company. 14—G. J. McDonald, McDonald Rubber Co., Boston.

Iowa's Buying Power for the Coming Year Is 50,000 Cars

Of This Number 20,000 Will Be Distributed by Des Moines Dealers—State's Grain Crops Are Worth Millions of Dollars

DES MOINES, IA., March 13— Iowa farmers contributed a billion dollars to the general wealth of the great Hawkeye state as a result of the bumper crops of 1914 and the boast is made and not questioned that the state's pocketbook could show \$8,000,000,000 on appraisal, taking into account its rich farm lands, its live stock and its manufacturing interests. Its wealth per capita, figuring on farm wealth alone, is \$1,682, while a rough estimate would give the complete returns at at least \$3,500 per head.

Evidently Iowa's middle name is Prosperity, and because of these evidences of wealth it would not seem impossible that the Hawkeyes will buy at least 50,000 cars during the present year, a careful estimate that has been made by Secretary of State Allen, who takes a keen interest in motoring affairs and is justly proud of the fact that Iowa ranks sixth in the United States in the ownership of cars.

1,500 Dealers at Des Moines Show

And it is because of this great prosperity, tangible and not imaginary, that the 1,500 dealers who attended the sixth annual Des Moines show, which closed this evening, have gone home elated over the prospects. Most of them spent the week here and as a result it is predicted tonight that Des Moines alone will distribute at least 20,000 1915 cars throughout the territory controlled by this city. This territory in the main runs to the Missouri line and also radiates in other directions. Sioux City looks after the northwest section of the state, while Omaha and Lincoln, Neb., claim jurisdiction to within 100 miles of Des Moines on the west.

As a show, the Des Moines affair was a great success. There were 24 members of the association displaying their goods, while 6 not holding franchises in the local body were allotted space. In all, 44 makes of passenger cars were shown, while the accessories also had good space. President Bull of the Case company, President Jewett of the Paige, President Ford of the Saxon, Vice-President McDonald of the Moon, and General Manager Olwell of the Chalmers were among the big men of the industry who personally attended the show. In

addition, dealers' dinners were given by Studebaker, Chalmers, Paige and Overland, so that quite a national tinge was given show week.

In addition, there was a convention of thresher men here this week, which brought in an additional 2,000. And it was found that these thresher men are interested in motor cars and that they found time outside of their own convention to attend the show and give the cars the once-over.

Immense Value of Soil Products

Getting down to bald facts, which are backed up mainly by government reports, the returns on December 1, 1914, show the total value of soil products in 1914, which include corn, oats, wheat, barley, rye, flax, hay, etc., to be \$465,509,163, as against \$438,157,163 in 1913. Corn, of course, is Iowa's best bet, this cereal's value totaling \$200,029,280 for the yield of 263,689,600 bushels.

An even greater contributor to the state purse was the live stock, the value of which was \$470,271,700 on January 1, as against \$456,453,900 on the preceding New Year's day. When the count was made less than three months ago, Iowa farmers owned 1,600,000 horses, 58,000 mules, 1,377,000 milch cows, 2,683,000 other cattle, 1,249,000 sheep and 8,720,000 swine.

Still later returns are had from the weather bureau of the United States Department of Agriculture, announced March 1, which show that on that date the farmers of Iowa had in their granaries and ready to convert into money at any time, 3,010,000 bushels of wheat at \$1.37 a bushel, as against 4,264,000 at 79 cents a year ago; 140,000,000 bushels of 65-cent corn, as against 125,171,000 56-cent corn in 1914; 61,000,000 bushels of 50-cent oats, as against 67,260,000 bushels at 34 cents in March, 1914; and 2,060,000 bushels of 68-cent barley, as against 2,300,000 bushels at 52 cents a year ago.

These returns show that the farmers had more grain on hand March 1, 1915, than they had on the same date in 1914, and that the value was \$29,495,680 greater. At the prevailing rates this year, this supply of grain would be worth \$127,024,500, as against \$97,528,720 12 months before. Of course, the European war has

been largely responsible for this, but just the same this represents money, part of which the farmer can use in buying motor cars during the coming season.

Iowa is particularly proud of the fact that it leads all other states in the production of corn, oats and hay. The 1914 yield of corn, 389,424,000 bushels, was worth \$194,712,000, with Illinois second with 300,034,000 bushels. Iowa had 165,000,000 bushels of oats, worth \$67,650,000, while its hay yield of 4,071,000 tons was valued at \$323,953,000.

So much for the crops. Now let us take up the selling possibilities among the rural inhabitants and we will find just why the secretary of state thinks that Iowa will absorb 50,000 new cars this year. Again referring to the statistics, we find that in Iowa there are 217,044 farms averaging 156 acres each, and that there are 33,930,000 acres devoted to farming. There are 134,929 farmers who operate their own farms and 82,115 men renting, conducting farms for or in partnership with owners of farms. This really gives us 217,044 farmers in the state.

Importance of the Farmer

Now we swing for a moment from farm statistics to the state house where we consult the statistics of the secretary of state, who tells us that in 1914 there were 106,087 cars registered during the year. All of these, of course, did not come from the rural district—probably three-quarters of them—so that it will be seen that the field has hardly been scratched so far as the farmer and the motor car are concerned. Inasmuch as it is freely admitted that the time is not far distant when each farmer must own at least one motor car, not counting tractors or commercial vehicles, we find that seemingly there are at least 150,000 tillers of the soil in the Hawkeye state who can be listed as prospects.

With such an outlook it is small wonder that Iowa has climbed so high on the registration ladder. It now ranks sixth among the commonwealths, having added 34,241 cars during 1914, but it is the proud boast of R. M. Williams, in charge of motor car registrations, that Iowa has conducted this department at a lower percentage of operating cost

than any other state. It also ranks fourth in the amount of fees collected from registrations. Also, Williams points out that Iowa registered 1,119 more cars in 1914 than the combined registrations of Colorado, Florida, Idaho, Kansas, South Dakota, North Dakota and Montana. To be exact, Iowa put 35,241 new names on its registration rolls last year. To quote from Mr. Williams' report, we find that the registrations of the leading states, the amount of money collected, and the operating expenses to be as follows:

A Comparison of Registrations

State	Cars Registered	Fees	Operating expense per cent
New York	168,223	\$1,529,852.36	20
Illinois	131,140	699,725.30	..
California	123,504	1,338,785.25	11.6
Ohio	122,348	685,000.00	11.8
Pennsylvania	110,963	1,184,645.50	6.9
Iowa	106,087	1,040,135.54	5.6
Massachusetts	77,246	922,469.75	13
Michigan	76,014	183,169.30	36
Indiana	66,500	430,307.55	11.1
Wisconsin	53,160	293,580.00	8
Missouri	50,998	235,873.50	43

Iowa estimates that 60 per cent of its registrations come from the farmers, and also reports that there are 38,000 Fords in the state. Also the secretary shows with pride the growth in car registrations. In 1907 the count showed 1,945 cars; in 1908, 2,165; 1909, 5,513; 1910, 10,410; 1911, 29,163; 1912, 42,628; 1913, 71,722; 1914, 106,087. Figuring at an average of \$1,000 per car, Iowa at present owns more than \$100,000,000 worth of power-propelled vehicles.

Here is what Iowa boosters say of their state:

Burlington has the largest furniture factory in the United States.

Muscatine has the largest food products plant in the United States.

Dubuque has the largest millwork establishment in the United States.

Charles City has the largest traction engine factory in the United States.

Fort Dodge has the largest wall plaster and motor board factory in the United States.

Waterloo has the largest cream separator factory in the United States.

Ames has the largest plant for the manufacture of felt pennants in the United States.

Iowa City has the second largest jewelry manufacturing business in the United States.

Ottumwa has the largest plant for the production of hay-working machinery in the United States and the largest independent pork-packing plant in the United States.

Des Moines has the largest burial casket and hearse manufacturing plant, the largest independent cement plant, the largest paving producing plant, the largest plant for the manufacture of women's ready-to-wear wool garments, the largest egg-desiccating plant, the largest roofing tile plants and the largest patent medicine plant in the United States.

In Iowa there are 3,434 general stores, 2,675 grocery stores, 1,706 banks, 1,047 implement dealers' stores, 709 clothing stores, 375 dry goods stores, 1,053 shoe stores, 1,091 furniture dealers' stores, 1,076 milliners, 813 jewelers, and approximately 2,000 motor car dealers.

There are 1,400 postoffices in Iowa. There are only seventeen towns of over 10,000 inhabitants and one of over 50,000.

The per capita wealth is almost 50 per cent greater than the average for the United States.

IOWA'S 1914 CROPS EXCEED THOSE OF 1913 BY \$300,000

	1914 on Hand			1915 on Hand	
	Bushels	Value		Bushels	Value
Wheat	4,264,000	\$3,368,560	Wheat	3,010,000	\$4,123,700
Corn	125,171,000	70,095,710	Corn	140,000,000	91,000,000
Oats	67,260,000	22,868,400	Oats	61,000,000	30,500,000
Barley	2,300,000	1,196,000	Barley	2,060,000	1,400,800
Total	198,995,000	\$97,528,720	Total	206,070,000	\$127,024,500

The number of manufacturing establishments in Iowa is reported in the 1910 census as 5,528, with an average number of wage earners of 61,635, ranking twenty-ninth among the states of the Union in this respect; value of manufactured product, \$259,238,000; value added by manufacture, \$88,531,000, ranking twenty-second in this respect.

Capital to the amount of \$171,219,000 is employed, the salaries amount to \$10,972,000, the wages to \$32,542,000, the material cost, \$170,707,000.

Having absorbed all these figures one's respect for Iowa increases materially and one can readily foresee the great future ahead for the motor industry. The 2,000 dealers all report a great business and greater to come.

Banks Not Antagonistic

Leading distributors also say that bankers are looking more kindly on the motor car business than last fall, when the feeling existed that the monied interests were somewhat antagonistic and were refusing to loan farmers money with which to buy motor cars.

"I am a director in two banks myself and I find no such feeling," says Charles Herring, president of the Herring Motor Co., handling the Ford in the state. "In fact, the Iowa bankers have all kinds of money and there does not seem to be any limit to their wealth. The government requires that each bank maintain a 25 per cent reserve, whereas at the present time the average reserve in the Iowa banks is about 40 per cent.

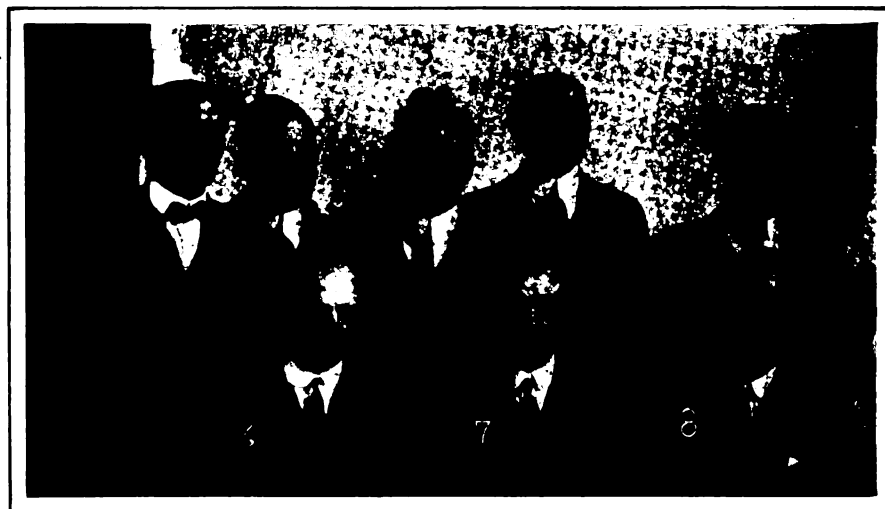
"I am looking for Iowa to add about

the same number of cars as it did in 1914, and I estimate that of this there will be about 66 per cent of what you might call new business, by which I mean people who never have owned cars before. I find that the six-cylinder is making rapid progress in the field above \$1,000, but below that mark the four holds its own."

Still another big distributor who also is a banker is H. E. Sidles, president of the Nebraska-Buick Auto Co., of Lincoln, Neb., and also president of the German-American State Bank in that same city. This company also has branches in Omaha and Sioux City, and takes in considerable Iowa territory, selling 2,000 Buicks to the Hawkeyes in 1914. He expects to increase this to 2,500 this year, while he looks on the Chicago Buick branch to place 2,000 Buicks in this state in 1915.

Easy Feeling on Money

As evidence of the easy feeling in the money market he cites the recent big order which he placed for eight trainloads (1,012 cars) of Buicks, to be delivered at the rate of one trainload of 50 carloads a week. Every one of these has been delivered and accepted, showing, he says, that there is no stringency in the money market so far as motor cars are concerned. Mr. Sidles declares that this year 75 per cent of the cars sold to Iowans will be to those who do not own cars now.



DIRECTORS OF THE GARAGE & REPAIRMEN'S ASSOCIATION OF CALIFORNIA, INC. 1—J. H. Brandt. 2—G. J. Woodward. 3—George R. Welborn. 4—A. M. Shepard. 5—C. H. Kratz. 6—G. W. Sundberg. 7—President W. H. Jahns. 8—Secretary R. C. McClay

Monarch Adds \$1500 Eight

Herschell-Spillman Motor Mounted in Same Chassis as the Six—Many Body Refinements

An eight-cylinder car which is similar to the six, as far as the chassis design is concerned, is offered by the Monarch Motor Car Co., Detroit, at \$1,500, which is \$250 more than the price of the six. When the design of the chassis was developed provision was made for using an eight-cylinder motor should the demand warrant it, and the parts are all well able to take care of the additional power delivered by the larger engine.

The motor used is the Herschel-Spillman, its overall dimensions being practically the same as those of the Continental six with which it is interchangeable. The cylinders are 3 x 5, giving an S. A. E. rating of 28.8 horsepower, and are cast in two blocks arranged in the usual V-shape; an unusual feature, however, is that the cylinders of the two blocks are not directly opposite one another, but are staggered to permit two opposed connecting rods to have separate bearings on the same crankpin, the pins being made sufficiently long for the purpose.

Water Pump Is Double

The motor is of the unit power plant type with three-speed gearset and Hartford cone clutch enclosed in a bell housing. Both the crankshaft and the single camshaft are carried in three bearings. Lubrication is by pressure which varies from a minimum of 10 pounds to a maximum of 40, according to speed; a gear pump circulates the oil.

Cooling water is circulated by a double pump having two intakes and two discharges, taking care of the cylinder blocks separately—as though there were

two separate pumps, in fact. Starting and lighting are effected by a Ward-Leonard two-unit equipment, the starting drive being through a Bendix gear.

From the clutch back the eight-cylinder car does not differ from the six as

MONARCH EIGHT AT A GLANCE

Pr.ce, touring	\$1,500
Color	Dark blue
Make of Motor	Herschell-Spillman
Number of cylinders	Eight
Bore	3
Stroke	5
S. A. E. rating	28.8
Starting-lighting	Ward-Leonard
Clutch	Cone
Gearset	3-speed
Wheelbase	125
Tires	33 x 4
Steering	Left
Control	Center
Make rear axle	Salisbury
Type rear axle	¾-floating
Equipment	One-man top with cover and curtains, windshield, Stewart speedometer with propeller shaft drive, gasoline gauge, tire carriers and tools.

far as the chassis is concerned. The open propeller shaft has a universal at each end and drives to a three-quarter floating Salisbury axle mounted on Hyatt roller bearings throughout. Special internal trussing is employed to give ample strength. Brakes are internal and external on 12 x 2½-inch drums and the



Front compartment of the Monarch eight, showing the individual front seats with passageway between them. The upholstery is full leather

equalizers are carried on the axle housing. Rear springs are elliptic and the supports are substantially reinforced.

The tires are 33 x 4, the wheelbase 125 inches and the tread 56 inches. Left drive and center control are employed. Drive to the Stewart speedometer is from the propeller shaft.

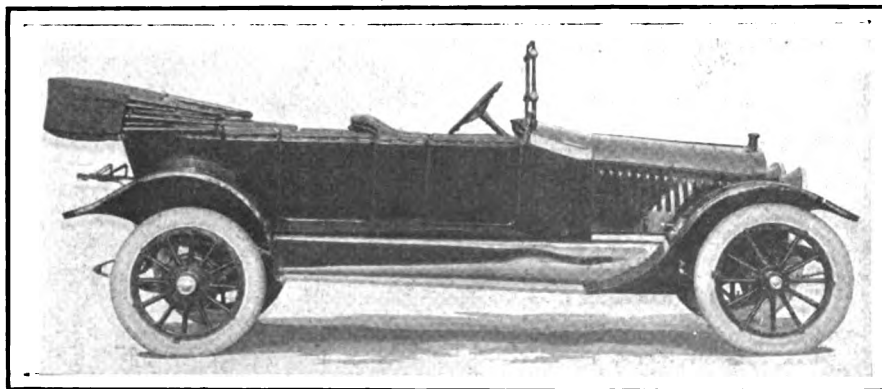
The body differs somewhat from that of the six, though not radically. It is of more refined construction, has full leather upholstery and is better finished. The general appearance, however, is so much like that of the six that it requires more than a casual glance to detect the difference at a little distance.

Excellent streamline design design marks the body, which is finished in dark blue as a standard color. The front seats are individual, there being a passageway between them, permitting passengers to move about to any part of the car. Two folding seats are installed in the tonneau. The doors have concealed hinges.

The fuel tank, which has a capacity of 13 gallons, is housed in the cowl. The instrument board is arranged in the conventional way and is illuminated by a conveniently placed lamp.

The six-cylinder motor, which also is fitted to this chassis, has L-head block-cast cylinders 3½ x 5, the S. A. E. rating being 29.4 horsepower. The starting-lighting system is the Ward Leonard and the ignition is taken care of by an At-water Kent system; the starting drive is through a Bendix gear, as in the case of the eight. Unit construction is employed, the gearset providing three speeds and the clutch being a cone.

One of the most important changes in San Francisco tire circles is the announcement by district manager W. H. Bell of the Kelly-Springfield Tire Co., that the Weinstock-Nichols Co. will hereafter handle the Kelly-Springfield tires in both their San Francisco and Oakland stores.



The general appearance of the eight is much the same as that of the six; the motors occupy the same space. The body is of somewhat more refined design and the finish is of a higher grade throughout. The same chassis is used for both six and eight, the difference being only in motors and bodies



- 1—Right Garage, Right street, La Salle. A. T. Faull, proprietor, occupies second floor. Handles the Packard.
- 2—Miller Bros., one of the largest in Dixon. Handles Overland and Velie.
- 3—George Netzt's garage, Dixon. Netzt has a modern business system. Handles Ford and Auburn.
- 4—Cadillac Auto Co.'s garage and salesroom, La Salle. Dealer in the Cadillac and Oldsmobile.
- 5—G. W. Brokhausen's garage, salesroom and service station, Freeport; Blokhausen in door. Largest establishment in Freeport. Ford, Briscoe, Moline, Paige and White.
- 6—Neville Garage, Amboy. This is the best garage in Amboy. Edmund Neville, proprietor.
- 7—Central Garage, La Salle. Modern office and business system, salesrooms, storage, repair-shop and supply department.

Course of Lectures for Owners

Prospects, too, Will Be Invited to School Chevrolet Dealer Will Conduct in His Salesroom—Educating Owners Will Simplify Service Problems and Cement Friendships

AN ounce of prevention is worth a pound of cure, particularly when the prevention is applied to motor car troubles. This is what W. A. Sellon, manager of the Brooklyn branch of the Chevrolet Motor Co., believes, and acting on this idea he has started a school for owners, in the salesroom. Prospects also will be invited, because he thinks that the best way to convince a man of the merit of the product is to tell him all about it and hold nothing back.

Two classes will be held every Thursday, at 3 P. M. and 8 P. M., beginning March 25, and will be under the direction of Sellon himself, who is a clear and convincing talker. A partially assembled chassis will be used to show the different features of construction, and the course of lectures will be arranged in such a way that pupils may enroll at any time.

It is expected that these classes will benefit the owner by enabling him to obtain better service from his machine; that it will benefit the branch by reducing the time that must be devoted to making adjustments, and that it will be the means of convincing many prospects that they should become Chevrolet owners.

The lectures are planned to educate owners not to blame the carbureter when the breaker points on the magneto are out of adjustment; and to educate him not to expect to have his valves ground free of charge, nor wonder why his tires wear out if he drives with his wheels out of line.

In other words, by teaching a man how the car works and how to take care of it, he becomes more reasonable; he knows what to expect and what not to expect, and fewer misunderstandings result. Moreover, free service work is minimized, because serious troubles are nipped in the bud and minor ones are taken care of by the owner instead of being left to the service man. In other words, Sellon is bolstering up the owner's confidence in his own ability.

Furthermore, the free instruction brings the owner to the salesroom frequently, weekly perhaps, for many weeks; he becomes well acquainted with the different members of the organization; becomes familiar with the company's policies, he realizes that all are working together and trying to give

him maximum satisfaction, and he becomes a booster. As he becomes better acquainted he realizes that a personal interest is being taken in him and his car and that he is not merely another owner.

His weekly visits enable him to ask questions directly affecting the operation of his particular car, and when he has some small trouble that he cannot fix himself he speaks to the service man about it because he is within easy reach instead of waiting several weeks until the trouble gets serious.

As he becomes more familiar and more enthusiastic he begins to recom-

The Triple Alliance for Chevrolet Owners and Prospective Buyers Chevrolet School of Instruction

To be held at the office of the Chevrolet Motor Company's Brooklyn Branch, 1505 Bedford Avenue, every Thursday afternoon, at 3 P. M., and evening, at 8 P. M., beginning March 25th, for the benefit of CHEVROLET Owners, and Prospective Buyers.

This is a factor that should not be overlooked by you. No expense is being spared to make it a success and we solicit your hearty co-operation.

1. Object. To bring into closer connection Owners, and Prospective buyers, with the CHEVROLET MOTOR COMPANY, and its Product.
2. Fitness. To establish means whereby an owner may become proficient in mastering all details of his car, and to familiarize him with the mechanical parts.
3. Results. Greater efficiency, minimum of maintenance, and a perfect running car at all times.

You are cordially invited to attend these Lectures which will be under the Direct Supervision of W. A. Sellon

Chevrolet Motor Company
Brooklyn Branch
W. A. SELLON, Manager

Sellon announced his School for Motorists by distributing handbills like this at the Brooklyn show. It tells the plan of the school briefly

mend the car to his friends, and every once in a while he gives some salesman a tip. One owner sold three cars, just because he was given satisfactory service, so that it is easily seen how the new idea will work out in this respect.

But it is also expected that many benefits will accrue from educating prospective customers, although no comparisons will be made between the Chevrolet and other cars. In the first place, the prospect will become thoroughly familiar with the Chevrolet product and will be impressed with it, not only be-



W. A. Sellon, manager of the Chevrolet Motor Co. of N. Y., Brooklyn branch

cause of its intrinsic merit, but also because it is a human weakness to favor that with which one is most familiar; and as the knowledge of the prospect grows his good opinion of the car will also increase. The instruction will also bring out why the particular features in these cars have been adopted in preference to other features.

Prospects will be brought into contact with owners, and this will result in increased confidence because it will show that the company has nothing to hold back, and the prospect cannot fail to be struck by the attention and service given each owner. It will allow prospects to obtain first hand information as to how the cars stand up; it will not be necessary to take a salesman's word for it. Furthermore, if it happens that the prospect is wavering between this and some other car, one of these visits to the salesroom may decide.

Lloyd Heads Metropolitan Engineers

The last meeting of the Metropolitan section of the Society of Automobile Engineers, held last week, marked the close of its fiscal year. Besides the business coincident with the closing of the year, the subject of discussion was the report of the gasoline-electric research committee, which was appointed early in the summer of 1914 to investigate and report on the status of this art. The report was a preliminary one.

Robert McAllister Lloyd, consulting engineer, was elected chairman of the section for the ensuing year, succeeding Joseph A. Anglada, who held that office for the last three years. J. Edward Schipper was elected secretary and Prof. W. C. Marshall treasurer. Under a new form of constitution adopted prior to the election, the governing committee is increased from three to five members, ex-President Anglada and N. B. Pope, the retiring secretary, being elected as governors to serve for one year.

Salesroom Needed By Garageman-dealer

Doesn't Have To Be Gorgeous or Expensive, But Must Be Clean, Says Reilly—Cleanliness Is Catching

By Ray W. Sherman

"DON'T forget that trip to Hill Valley," said Nellie, who was the official typewriter chauffeur, memorandum keeper, emergency salesman and corporation representative at large in the establishment of C. J. Reilly, Inc., the Callawassa city and county representative of the Sennett Motor Car Co.

Reilly made a dive into the leaves of his memorandum calendar and pawed furiously for some time; finally he emerged triumphant. He had found the name of Chester Bement, one of Hill Valley's citizens.

"Gee! I almost forgot him!" he said after this session of memorandum pawing. "Guess I'll run down today. It's a nice day anyway and I might as well make the trip in good weather as bad."

Sunshine Wins

Charley McGrain, the senior salesman, was on the job, and Tommy Trumbull, who constituted the remainder of the sales force, looked wistfully at the late March sunshine without.

"Get out the demonstrator, will you Tommy?" asked Reilly, and as this youthful salesman went by Charley his face bore a rough-on-you-old-top grin—all of which Charley took pleasantly because there was nothing else to do.

The run to Hill Valley was exhilarating; down through the beautiful country and over the hills to the little village where Chester Bement wished to be established as a subdealer under Reilly in the Sennett line. The business was of short duration and they were soon on their way back over the thirty miles of pretty good roads. Bement was practically signed up; everything would be satisfactory when one or two little details were straightened out.

"Not such a bad scout, is he?" said Tommy as the car topped the rise which cut off the little valley from the rest of the world.

"No, not so bad," was the dealer's answer. "I've seen worse—quite a lot worse. And a few better ones."

"I guess there are always better ones no matter how good they are," vouchsafed Tommy, gazing absent-mindedly off down the still leafless side of the rise of land along which the road wound its way.

"Never a perfect one yet," said Reilly, "and never will be. When that day comes I hope to be numbered among the discontinued models."

"Bement seems to have sold a few

"Oh, several things," was the general explanation. "He evidently never had much assistance from factory men and doesn't appreciate the value of a few fundamental points of car retailing. It is some of those things I want to show him."

"What?" This was the second time Tommy had said "what," and unless he found out what he wanted to know it was not unlikely he would issue a third edition—but Reilly, carefully rounding a wooded turn, came across with the beginning of his explanation.

"One thing he needs," he said, "is a salesroom. You probably noticed while you were there that he has no salesroom."

Needs a Showroom

"Yes, I did notice that."

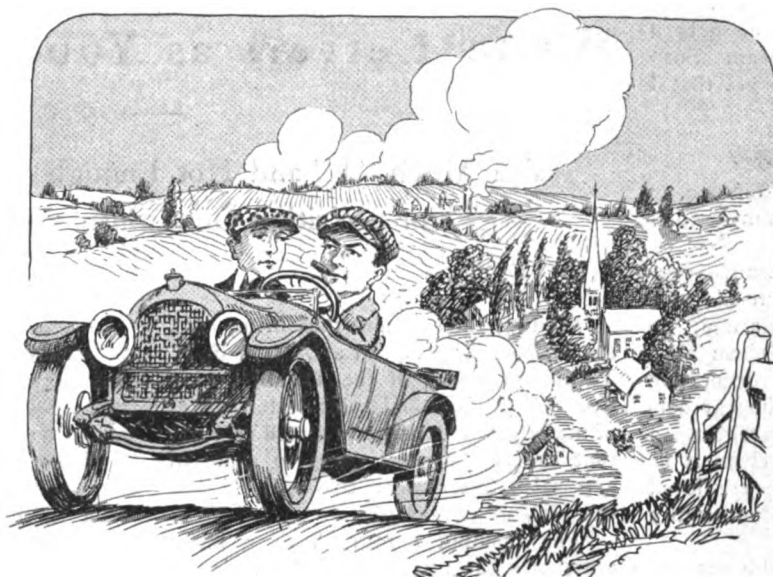
"Well, he may be able to get along without one, but I maintain that the man who sells cars ought to have a showroom. If he ran a grocery store he would have counters and if he ran a drygoods store he would have some display facilities; why, he might even trim a window. So why should not the man who is selling cars have a salesroom?"

"I think he should," wisely agreed the younger man.

"I have seen a lot of subdealers and dealers who were far from being in the sub class," added Reilly, "and in a great many towns they do not have salesrooms. If they had no place of business at all it might be to an extent excusable, but what I refer to is the garageman who tries to show cars in a garage. I do not think it is good business."

"Take Bement's case. He has a fairly good one-story building and does quite a little transient garage business, for he is on a good north-and-south road which brings business to him when the weather is good. His garage is as good as the average and is better than the rest for nearly eighty miles."

"When he took on the Criterion agency he had been running a garage for some time, and his demonstrating car he sim-



"Not such a bad scout, is he?" said Tommy, as the car topped the rise which cut off the little valley from the rest of the world

Criterion cars down there, but he seems quite confident he can do some business with our more medium-priced line."

"Yes, I think he can," agreed Reilly. "He has done real well, and I think that with some assistance he can do considerable business in this rich little section of country."

A Few Rough Spots

"He could stand a little boosting in some ways, I think," volunteered Reilly's companion. "I noticed several little spots I thought would stand improvement."

"There are several little spots," asserted the man at the wheel, "and I am anxious to see what I can do with Bement and how the experiment will pan out. One reason I want to give him the subagency is to see if I can't work out some schemes with him."

"What?"

ply stood in one corner of the garage; inasmuch as he used it all the time it probably wasn't in showroom condition, and looked just as well in the garage as anywhere else, but when he bought a new car next year and put a couple in stock early in the spring he put them in the garage, too. That's what I don't like."

"Not a very hot arrangement," said Tommy.

"If it were an expensive proposition I wouldn't think of asking him to build a salesroom, but the cost is very, very reasonable. All he needs to do is get some building material and build a room in one corner of the front of the garage; it doesn't have to be much bigger than one car requires with comfort. He does not have to spend a lot of money on it; the principal thing is to get a room fenced off from the rest of the garage.

"It should be large enough to accommodate the car with room to walk around it, and the better show window he can build the better. And after he gets it done he wants to keep it clean. Soap and water never killed a sale yet that I ever heard of."

Advantage in Car Display

"It would make some difference in things, wouldn't it?" was Tommy's comment.

"To me it is a distinct disadvantage for a dealer-garageman to put his new cars on exhibition in his garage; no garage ever is so neat and clean as a salesroom; the salesroomy, decorative effect cannot be secured. The car sets in the front corner of the garage on a floor which, no matter how clean it is, is never any better than dusty colored concrete, and there is no opportunity to show off the new vehicle.

"Back of the new car are the cars on storage; you noticed that Bement has quite a few customers who put their cars up in the winter and leave them; well, his new car has to stand right alongside this row. The comparison is unfavorable. The new car looks better by comparison with the others, but there is suggested to the prospect the thought that some day his new car will get old, whereas if it is shown in a separate room with the furnishings and decorations new and clean the psychological effect is better.

Beneficial Effect on Business

"And there is this further advantage. If he builds a new salesroom I shall insist that he keep it clean and up-to-date and that, I think, will have a beneficial effect on his whole business. It is just like buying a pair of new shoes; they make the rest of your outfit look so shabby that you generally end up by buying a new suit of clothes, a new hat, new shirts and a whole new set of duds.

"And it is the same way in this bus-

iness—or any other similar business. Clean off one spot and you have got to clean up the rest or let the cleaned spot get dirty again. If you insistently keep the one spot clean you are quite likely to go at the rest of the place and clean that too.

"That's what I want to try out on Bement. I am going to insist that he build a salesroom; not an expensive one, but a well-decorated and neat one. Then, I am going to insist that he keep it cleaned up and keep the car on display bright and new. I am not going to ask him to clean the garage or anything else; just the salesroom and the car. Then, I am going to watch to see what happens; it has always been my theory that the other scrubblings will follow."

"It sounds well, anyway," laughed Tommy.

"If any dealer came to me," asserted Reilly, "and said he wanted me to tell him the first step to take in revamping

his business I would tell him to buy a mop and a mop pail and scrub out. So many places are unclean. I think it is an excellent practice for every dealer to make a regular and systematic inspection of his establishment with an eye to cleanliness; if he sees dirty corners and old waste on the floor, he should order a cleaning up and ascertain who is responsible for the dirt. If he can keep clean he has taken a big step toward making more money."

"So that's why I'm going to have Bement build a salesroom before I will give him the subagency. He may never sell an extra car because of it—but it ought to make a difference in sales at that. The result will be interesting—but I am sure of it."

"Sounds like the drunkard in Uncle Tom's Cabin—or the nigger in Ten Nights in a Barroom—or something like that," was Tommy's literary fizzle which nearly ended the trip in a culvert.

Write Letters as You Would Talk

Too Much "I" and Not Enough "You" a Common Error—Writing Good Business Letters an Art

"Writing sales letters that bring back the business is truly an art," says F. H. Tuthill, president of the Tuthill Spring Co. "A professional sales letter writer of many years' experience stated recently that the two hardest parts to write of any sales letter were the opening and the closing paragraphs.

"The opening paragraph of a letter must grip the attention of the recipient and lead him into the copy that follows. The closing paragraph must induce him to act at once instead of next week or next month.

"Probably 90 per cent of all sales letters are written from the wrong angle. There is entirely too much of the 'we' and 'I' element in the letters instead of 'you' element.

"At heart we are all selfish, and in order to write sales letters that are effective one must talk to the recipient about his interests, his needs and what the car or accessory will do for him or add to his pleasure.

"It is also a remarkable fact that when a high-grade, competent, successful salesman sits down to write a sales letter he changes his whole personality. He digs up from the hidden recesses of his vocabulary the longest, most complicated, intricate words and sentences that he can find. His language becomes stiff and formal. He puts on paper things that he would never, in a thousand years, say face to face to a prospect.

"When a sales letter is to be prepared the writer should imagine that the prospect is sitting opposite his desk, and then he should write just as he would talk in a personal interview.

"If the letter is to be sent to a list of one thousand, he must not direct his letter to this entire group of one thousand, but instead, talk to each individual in the group, because each letter will be received and read by some one individual.

"The question has often been asked, 'How long should a sales letter be?' and the answer is, 'Just as long as you can grip and hold the attention and interest of the recipient.'

"Another question that has often been asked is, 'How many letters should constitute a follow-up?' Before preparing a series of follow-up letters or post cards, take a sheet of paper and tabulate on it the list of strong selling points which you wish to present in your follow-up letters. Then do not attempt to incorporate all of the selling points in any one letter. In each letter take up one or two of the best selling points and pound them home in such a way that the recipient will remember them long after he has consigned your sales letter to his waste-basket.

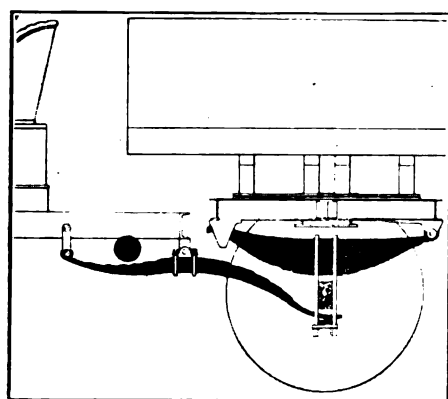
"Testimonials can be used effectively in two ways. They can be enclosed with the letter or be incorporated as a part of the copy in the letter itself."

Hydraulic Brakes on Knox Four-wheel Tractor

Designed for 10 Tons But Can Be Hitched to Anything It Will Pull—Valve-in-head Motor Retained

Several important changes have been made in the Knox-Martin semi-tractor, manufactured by the Knox Motors Co., Springfield, Mass., chief among which is the abandonment of three-wheel design for the more conventional four-wheeled chassis. A hydraulic brake has been installed, the motor is self-governing, the differential is fitted with a new type of lock, control is centered in a triangular board and electric lighting and starting are regular equipment.

In a general way the design of the machine is unchanged, inasmuch as it is fitted to carry the front end of a two-wheeled trailer on a special fifth-wheel. The fifth-wheel does not rest on the tractor chassis proper, however, but on a steel frame carried by semi-elliptic springs mounted directly on the rear axle of the tractor. The rear springs of



Separate rear springs for tractor chassis and trailer front end

the tractor chassis are cantilevers and their rear ends are clipped to the lower side of the axle, the trailer front springs being clipped to the top of the axle; this gives each part of the complete unit a separate and independent spring system and relieves the chassis springs of all trailer load.

The hydraulic brake, which is actuated by a hand lever, consists essentially of a pump which forces oil into cylinders having pistons connected through suitable rods with the brake mechanism. The incompressibility of the liquid makes the connection between the pump and the cylinder positive. A latch permits the locking of the brake. The foot brake is of the conventional type and acts on drums on the jackshaft.

The heavy loads handled necessitate



Many improvements have been made in the new Knox tractor, there now being two wheels in front instead of one, powerful hydraulic brakes and a double rear spring system

enormous braking capacity. The hydraulic brakes work on internal drums 20 x 6½ inches and are Raybestos lined, and the foot brake drums on the jackshaft are 14 x 4 inches with shoes of cast iron; the drums have integral cooling flanges. Any desired force can be applied to the hydraulic brake by repeating pump strokes, which increases the pressure, the oil being held by a check valve. Opening the valve releases the brake by permitting the oil to flow back to the reservoir.

Valve-in-the-head design is retained in the motor, which has four cylinders 5 x 5½, cast in pairs. The valves are carried in removable cylinder heads and the operating mechanism is exposed. The rocker arms have been fitted with ball bearings. The carburetter is mounted high on the motor and is supplied with fuel by Stewart vacuum feed; it is high enough so that the truck can be operated through water 31 inches deep. Ignition is by Mea magneto with fixed spark position; the ignition system is dual, the starting-lighting battery constituting an alternative source of current. Bijur starting-lighting equipment is used.

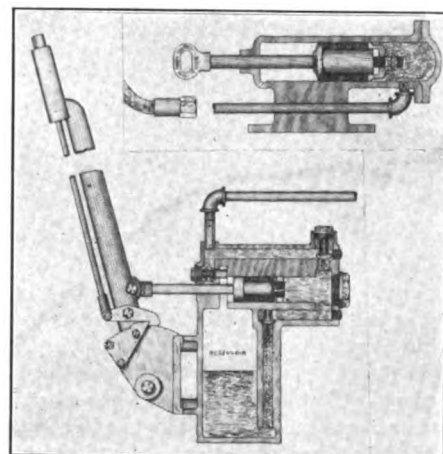
The self-governing feature of the motor is attained by designing the valves to permit the motor to accelerate rapidly to 1,000 r. p. m., at which speed maximum power is developed. At higher speeds the power falls off. Under heavy load, therefore, the motor cannot exceed a speed of 1,000 r. p. m., but with a light load, or when the going is good, the speed may be augmented somewhat.

Drive from the motor to the jackshaft is through a three-plate clutch with cork inserts, and a three-speed gearset incorporated with the jackshaft. The differential lock is on the right axle shaft

and consists of a jaw clutch with one member on the differential housing and the other sliding on the shaft; the jaws cannot be engaged unless the gears are in neutral.

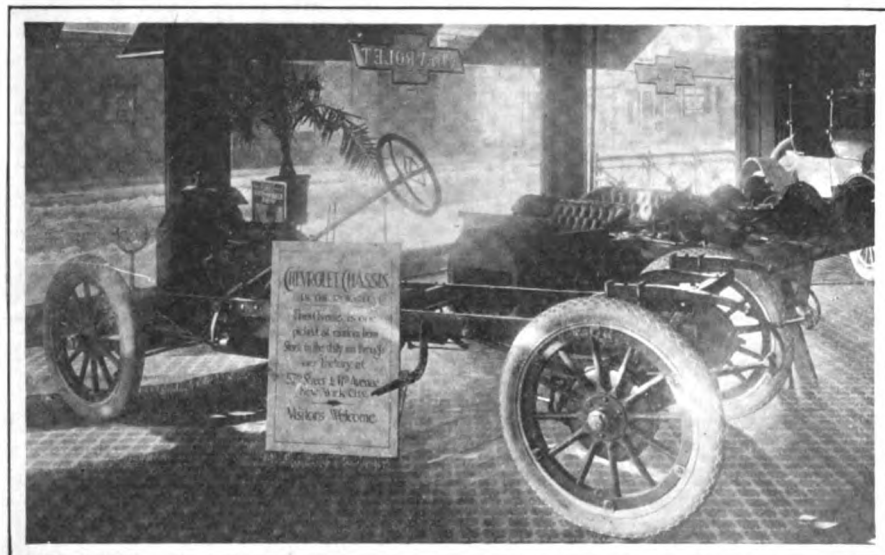
The wheelbase of the tractor is 108½ inches and the tread is 57¾ inches front and 62⅓ in the rear. The overall length is 12 feet 10 inches, the road clearance 10¾ inches and the tractor will turn in a 30-foot circle. The normal maximum speed is 9.4 miles an hour, though for fire apparatus this can be increased to 33 miles an hour.

The manufacturers impose no restrictions as to load or speed. The motor cannot be oversped because of the drop characteristic referred to, and while the normal trailer load is figured at 10 tons, the machine can be coupled to any load it will pull. If the load is too heavy the motor will fail to pull it and no harm will result.



Oil pressure on plunger in upper part of picture applies brake; pump operated by lever supplies pressure

WIDE-AWAKE MERCHANDISING



A Chevrolet car arranged to show what lies under the paint and upholstery, and also the mechanical parts that usually are hidden from view

Staged "Under-the-Paint" Week

Chevrolet Dealer Drew Crowds to View a Chassis "In the Buff"—Table of Parts Also Added To Attractiveness of Display

"Under-the-Paint-Week" was the apt way in which the Chevrolet Motor Car Co. of New York described a special display in its New York salesroom. A chassis and body in the rough and a table full of representative chassis parts were used to attract new prospects, and to convince the prospects already on the books that the Chevrolet is the machine they should buy.

Not Afraid to Show What They Had

The exhibition was the idea of M. B. Leahy, sales manager. Large crowds were attracted to the store every day. Not only was the exhibit a success in that many new names were added to the prospect list, but it served to demonstrate to all that visited it exactly what goes into Chevrolet cars—something that cannot be determined when the surfaces are covered with paint. Furthermore, it

proved to prospects that the company was not afraid to show what was underneath the paint and varnish.

Also, the exhibit of parts gave the prospects a chance to examine the construction of the various car components and to judge of the material and finish; and the stripped chassis and parts both served to help the salesmen in explaining principles to novices.

The chassis was entirely without paint except for a coating of red lead on the brass radiator casing, evidently put on by the radiator manufacturer to prevent tarnishing; even the blue ring around each rivet in the frame was visible, showing that the rivets were put in hot.

Vital Parts Displayed on Table

The body had only received a priming coat and was left unfinished on the right side so that it was possible to

examine the leather, horsehair and springs comprising the upholstery, and also to observe the method of attaching the body panels and how the bracing was done.

The chassis parts on the table included cylinder block, cylinder head, gasket, valves, rockers, camshaft, timing gears, crankshaft, intake manifold, crankcase, connecting rods, pistons, gearset with cover removed, differential and axle shafts, half of axle housing showing brakes.

Every Live Prospect Invited

The exhibition grew out of the interest shown in a similar exhibition of a chassis in the rough during the week of December 7. Many who missed the former exhibit were anxious to have another chance to examine the rough chassis, and so this was staged with the added features of a body in the rough and a table full of parts of the more important kinds.

A letter announcing the exhibit was sent out to every live prospect calling attention to the exhibit and outlining what there was to be seen. This letter follows:

A Letter That Pulled

During the week of December 7 we exhibited a Chevrolet chassis "in the rough." People who saw it marveled at its wonderful construction; others who didn't, have made trips to the factory at 57th street and 11th avenue. Some couldn't take the time and were disappointed.

To give everyone a chance we are going to have a week of

"Under the Paint"

from March 1 to 8, at this show room, Broadway and 51st street.

We will show you a chassis in the rough; a dismantled motor, transmission, rear axle and differential, a crankshaft, a camshaft, gears, etc., etc.

We will also show you wheels without paint, a body in the "lead," partially upholstered, so that you may see the substantial construction, the genuine leather, the fine springs and the real curled hair.

There are twenty-one paint operations on every Chevrolet body and it's a beauty when completed, but we want you to see the materials used to build this up. We want you to see that the unexposed parts are as good as the exposed; that there is nothing we are ashamed to show.

We are proud of every bit of material that enters into the construction of each Chevrolet car. Won't you give us the pleasure of showing it to you?

March first to eighth

Yours very truly,

Chevrolet Motor Co. of New York, Inc.

**AUTOMOBILES
REPAIRED**
—
**BATTERIES
RECHARGED**
—
**STORAGE LIVERY
AND SUPPLIES**
—
STEAM VULCANIZING
—
**BEST EQUIPPED REPAIR
SHOP IN FLATBUSH**

Sweeney & Nail Auto Co.
INCORPORATED
2184-86-88 CLARENDON ROAD
COR. FLATBUSH AVENUE
10-12 VANDERVEER PLACE
BROOKLYN, N. Y., March 5, 1915
**OPEN EVERY DAY AND NIGHT
FOR SERVICE.**

TELEPHONE 82 FLATBUSH

Dear Sir:-

We wish to inform you that on account of the dull season of the year we have decided to reduce our prices as quoted below to retain our present force of employees. We will state further that no other concern can compete with these prices with workmanship and material.

We invite your inspection to our shop which is thoroughly equipped with facilities for all kinds of machine and repair work. The work will be done by skilled mechanics and under my sole supervision.

Trusting you will favor us with any work you will have in this line, and assuring you entire satisfaction, we are

Yours truly,

SWEENEY & NAIL AUTO COMPANY.
per *H. Y. Nail*

Vulcanizing up to and including 2" repairs	.25
Larger repairs in proportion	
Recharging batteries	.25
Decarbonizing gas motors per cylinder (Oxygen method)	.25

We maintain a large stock of accessories at the right prices; acetylene, welding, radiator and lamp work done. We do not send our work to outside parties as our facilities are equal to any of the above.

We will gladly give estimate on all repair work.
H. Y.

UNEMPLOYED?

The newspapers are full of material about the "unemployed." You cannot pick up an issue without seeing some reference to it. As a result, everyone is thinking of this question. It is in everyone's mind.

Why not capitalize this feeling?

Why not inaugurate a DO IT NOW campaign?

Why not send out to all your customers and prospects a letter similar to the one reproduced herewith? Your repair department quite likely is slack at the present time. Now is the time to start something that will make the wheels hum and keep the men busy.

Here is a chance to hitch your business-getting letter to the "unemployment" problem. Explain that your repair department contains a number of men who may be "unemployed" and that to keep them employed you want work NOW—in the dull season—when you can give all the time necessary to it. Point out that a little later everyone will want work done at once.

CAREFUL! CAREFUL! ON CAR ALLOWANCES

If Having Most Sales Means Also Most
Used Cars on Hand, Beware

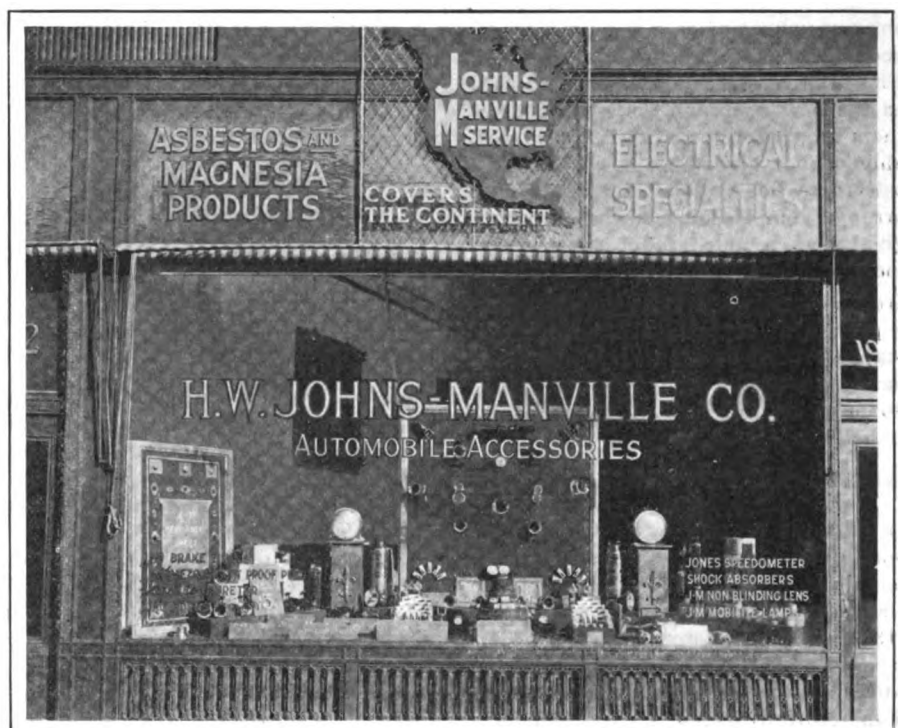
The man with the used car is now haunting the salesrooms of dealers the country over. He is searching for the dealer who will give him the biggest value for his used car and let him off easiest on the cash difference. Is he going to get you? Is he going to prove himself a better buyer than you are a seller when he gets to your store?

Are you going to have the record for making the most sales and also the record for having the largest number of used cars on hand of any concern in the city?

Used Cars Absorb Money

Such a result or record is not extraordinary. The worst feature of it is that used cars are hard to sell. They invariably bring less than was allowed for them. They take up just as much space as new cars. They can be allowed to absorb a very large sum of money. Profits tied up in used cars are not profits at all.

Attention-Compelling Simplicity Marks This Display



The H. W. Johns-Manville Co. employs a window trimmer and its windows are rearranged every two or three weeks. This shows the latest display at the New York salesroom

It Costs \$150 to \$200 to Sell a Used Car

Overhead Charges Bring the Amount Between These Figures, Says Allison —Enlarged Scope of Used Car Central Market Report

How much does it cost to sell a used car?

According to statistics which have been gathered by the Chicago Automobile Trade Association and made public for the first time by President H. M. Allison in the course of his address at the annual meeting of that organization, this figure can be placed at \$150 to \$200, exclusive of any loss the dealer may sustain at selling the car at less than the allow-

Let us raise the standard of selling used cars by refusing to guarantee a car which you do not represent.

Prohibit the peddling of credits by having a uniform blank covering the sale of a used car at a 20 per cent discount, and when the car is to be credited at a fixed price, have the form clearly state that the credit is not transferable.

Encourage the exchanging of used cars with each other whenever possible. You can each sell best the car you represent and if you have a car of your competitor's make and a competitor has one of your make, exchange cars on a basis satisfactory to both.

Don't put your used cars in a dark room and expect to sell them to advantage. The used cars are just as hard to sell as the new ones and you should give them an attractive setting. You probably cannot give them space in your salesroom but you can, no doubt, rearrange your building so that you can give them a much more satisfactory location.

Alfred Reeves, when sales manager for a prominent concern, asked a branch manager what he did with his second-hand cars, and he replied that he didn't do anything but dust them off occasionally.

ance plus the repairs. This figure represents overhead expense, which is made about as is given in the accompanying table, based on the sale of one car.

"It is safe to assume," said Allison, "that 90 per cent of the business today involves the handling of the used car, and therefore it behooves the dealer and each salesman to familiarize himself with the market conditions as given in our Used Car Central Market Report

and get the cars in at the right price so that the dealer will not have to add to his actual overhead expense of from \$150 to \$200 a car on used cars, a loss in the sale of the car over the allowance price.

"In view of the expense in selling the used car, I would recommend that all of our members charge not less than 20 per cent for selling a used car for a customer's account when an order for a new car is not involved.

"When we started last October to sell our Used Car Central Market Service outside of Chicago, the only objection we found from other trade associations, as well as car dealers, was that the prices, say, on used cars in San Francisco or in Boston, were not the same as they were in Chicago. During the latter part

OVERHEAD CHARGES ON USED CAR SALES

Advertising	\$25
Salaries and commissions....	70
Insurance	3
Interest on investment.....	5
Rent for space occupied.....	16
General overhead expenses, such as delivery, policy, office supplies, elevator, porter, light, heat, etc.....	78
Total	\$197

of the year we formulated a plan to make this service national in its scope by dividing the country into twelve zones similar to the Federal Reserve Bank zones and having the chief city in each zone act as the headquarters for our Market Report in that zone, and we contemplate that eventually each of these zone centers will have appraisalment committees working on appraisements of all the various makes and models of cars, the same as our local appraisalment committees do, and we will then have comparative appraisements.

"We had not made much headway up to the time of the New York show with trades associations in the East and your four executive officers gave a luncheon to the eastern trades associations at the Engineers' Club in New York City and explained to them in person our Market Report.

"The week following, your president went to Philadelphia and explained the

details of the service to the Board of Governors of the Philadelphia Trade Association. As a result of this work we have since had the following trades associations cooperate with us: New York, Philadelphia, Baltimore, Buffalo, Worcester, Mass., New Haven, Conn.

"The growth of this service has been most extraordinary. During the first 3½ months we received 110 subscriptions. During the second 3½ months, 315,

If you are handling your used cars in this manner you are not properly representing your factory and you are depressing the second-hand market. Keep your second-hand cars washed, and thoroughly polished, have the motors cleaned, see that they are started at least two or three times a week and see that they hit on all cylinders.

Don't be alarmed at the used car conditions. We are located in the Great Central Market of this country, and if you get your used cars in at a price that will permit you to do some mechanical work on them—repaint, recover tops, etc., and make them look saleable—you can sell them in this market readily.

Many people cannot afford the depreciation on a new car while they can afford a good used car with minimum depreciation.

Discourage the trading of year-old motor cars, particularly in cars costing over \$1,500. The first year's depreciation is the greatest and the year-old car is probably the hardest to sell unless, of course, you take it at a very low allowance so that you can repaint it, recover top, and do mechanical work on it, and if you make the depreciation too much it is bound to affect the sale of your cars.

showing an increase of 186 per cent in the last 3½ months over the preceding 3½ months.

"The following associations have endorsed our proposition and have subscribed for the service on the club-rate basis:

Electric Automobile Manufacturers Assn.
Rhode Island Automobile Dealers Assn.
Columbus Automobile Trades Assn.
Milwaukee Automobile Dealers Assn.
Motor Car Dealers Assn. of Los Angeles.

Kansas City Motor Car Dealers Assn.
 Buffalo Automobile Dealers Assn.
 Colorado Automobile Trade Assn.
 Philadelphia Automobile Dealers Assn.
 New Haven Automobile Dealers Assn.
 Baltimore Automobile Dealers Assn.
 Automobile Dealers Assn. of New York.
 Fort Dodge Automobile Dealers Assn.
 Portland Automobile Trade Assn.

"We have about four times as many subscribers outside of Chicago as we have members in our local association, notwithstanding the fact that about 98 per cent of the dealers in Chicago are members of our association.

"Our first issue of the Market Report on the zone-plan basis shows representation in seven of the twelve zones, namely, 1, 2, 3, 4, 5, 7 and 10, having headquarters respectively in the cities of Boston, New York, Philadelphia, Cleveland, Baltimore, Chicago, Kansas City.

"The zone divisions were necessary in order that this compilation could be made in one Market Report. In other words, it would be practically impossible on account of the heavy expense to publish a Market Report in each large city in the United States, besides we find that the greater the number of sales reported the better sales data each succeeding issue will contain.

"The present issue shows sales data of over 3,000 used automobiles. We believe the next issue will show that the large cities of New York, Boston and others cooperating will mean the sales data on a minimum number of 6,000 automobiles during a quarter. Can any dealer in the United States afford to be without this service for \$12 per year? Can any factory afford not to endorse the movement for the good it will do their dealers?

"In future issues of the Market Report the dealer in New York and San Francisco can refer to the Market Report as a guide on average sales data on various makes and models of cars, and if they organize their appraisal committees, as we have done in Chicago, they will have their local appraisements as a guide for future transactions, which service will be invaluable to them, to say nothing about the splendid spirit of cooperation and friendly feeling that is engendered when you get competitors together in appraisal committee meetings.

"A new feature in our current Market Report is the United States average. It was thought advisable to have some means of showing whether one or fifty

automobiles are arrived at in the sales averages. As it is very important that we do not show up any one sale, but treat the subjects on a basis of averages, we have shown in the current report in the outer column under the heading "U. S. Average," the average sales information on cars sold in all the zones and the letters indicate as follows:

a—5 and under
 n—between 6 and 10, inclusive
 u—between 11 and 15, inclusive
 v—between 15 and 20, inclusive
 g—between 21 and 25, inclusive
 x—over 25

"I am pleased to have with us tonight a very large number of salesmen. I want to say to the salesmen that they owe it to their employers to use the Market Report with prospective customers in getting the cars in trade at the market price. I doubt if many of the salesmen and perhaps some of our members actually know what it costs to sell used cars. I have talked with a number of our members and as near as I can arrive at it, it costs from \$150 to \$200 per car to sell each used car, over a period of one year, exclusive of any loss the dealer may sustain in selling the car at less than the allowance plus the repairs."

"Don't Over Buy," Policy Put in Effect by Accessory Maker

Standardization of Products Permits Manufacturer to Relieve Dealer of Slow-moving Stock

To stand behind dealer, jobber and distributor alike, and to do its utmost to further the business of all three, is the essence of a new selling policy adopted by the Emil Grossman Mfg. Co., Brooklyn, N. Y. The first move in carrying out the new policy is to advise dealers, jobbers and distributors not to over-buy, and linked with this is an agreement to take back at any time any goods that the purchaser finds hard to sell either through poor judgment on his part or changing conditions. "Don't over buy" is the order that has been issued to all.

The Grossman company believes that more merchants have lost money through over-buying than through any other cause, that overloading is ruinous to dealers, jobbers and distributors, as well as to the manufacturer, and that price-cutting is the inevitable result. Over-buying, it is emphasized, retards progress in that merchants are not in a position to add meritorious articles when new and therefore profitable because of the desire to get rid of the old stock first and thus a profit on the new things is missed and perhaps trade is lost.

The hypothesis upon which the Grossman concern is working is that the concern that buys more than it can sell in season finds that it must finally dispose of the stock at bargain prices in order

to clear it out and release the capital tied up in it. Meanwhile it is more than likely that the manufacturer is waiting for his money; possibly he needs it badly, yet he cannot get it until the goods are sold and the dealer has the cash.

Coupled with the advice not to over-buy is an agreement to take back any goods that are not found salable, due generally to changing conditions, but also to an error in the merchant's judgment. The Grossman company also agrees to credit the purchaser with any decline in the price of goods purchased and to turn over orders and copies of inquiries received from the territory in question.

Product Confined to Standards

Before this broad agreement could be offered much preparation was required. For the past 5 years the Grossman company has been working towards this end; first by eliminating all novelties in the line and confining production to standard motor necessities for which there is a demand year after year; and second by improving the quality and perfecting the design so that little or no change would be required in any of the articles from year to year. It was necessary to observe these points before it could offer,

with safety, to take back goods unconditionally.

For example, one concern might buy a lot of spark plugs with priming attachment, keep them six months and then find that it had bought too many. Inasmuch as they are a standard design the company can afford to take them back and sell them to someone else, but if the design or material had been changed meanwhile then the company would suffer a loss if it took them back, as they would be unsalable except at cut-rate prices. At the same time, if the company did not take them the dealer would be considerably out of pocket. Thus the importance of standard products is appreciated.

Likewise, all the products in the line must be necessities, such as spark plugs, bumpers, jacks, tire holders, and so on. Novelties for which there might be a demand today and none tomorrow could not be taken back without more or less loss.

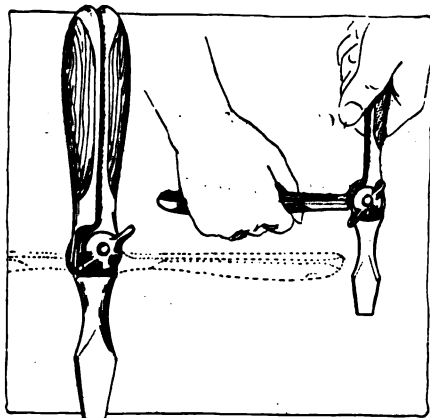
Additional help in selling goods will be rendered by advertising extensively in local newspapers, farm journals, and the national magazines. Also display cases for spark plugs, window displays, waterproof sign boards, pennants and posters are being prepared to help the dealer attract trade.

RECENT DEVELOPMENTS in ACCESSORIES

Screwdrivers for Severe Service

Occasionally it is necessary to turn a screw that is in an inaccessible place, or to move one that requires more than ordinary force. Special screwdrivers that are useful under such circumstances are manufactured by the H. D. Smith & Co., Plantsville, Conn.

One of these tools is a heavily made affair with a handle which is double and is jointed so that it can be used in four different ways—with the two halves brought together, when the tool serves as an ordinary screwdriver; with the two parts of the handle forming a T with the blade; with the two halves together forming an L with the blade, and with one part of the handle vertical and the other part horizontal. For ordinary work



Triple lever screwdriver for exceptionally heavy work

the handle is used in the straight position. Where very great leverage is required the second or T position is used, when both hands can be used to apply pressure. Where there is not room for the T position the L shape offers much more than the ordinary leverage and can be used in a space only $4\frac{1}{2}$ inches high. With one part of the handle vertical and the other at right angles the user can press down with one hand and apply pressure to turn the screw with the other. A wing-nut loosens and tightens the joint, which has stops to hold the handle positively in the positions described. The screwdriver is made to withstand heavy pulling, the blade being $\frac{1}{2}$ inch wide at the point and the shank very heavy. Total length, $9\frac{1}{2}$ inches.

The smaller screwdriver is of conventional form with two extra bits forged on each side near the point, one at right angles to the shank and the other parallel with it. The tool can be poked into a

space less than $\frac{3}{4}$ inch high and whichever bit is in the proper position dropped in the slot. If there is not room for a half turn of the screw the tool can be taken out and turned over to engage the other bit, which necessitates only a quarter turn of the screw. Total length, 9 inches; width of bits, $\frac{3}{8}$ inch.

Both tools are of forged steel and have Perfect handles, which means that the steel forging extends from end to end and is fitted with wood grips riveted on. The triple lever screwdriver, which is the one with the folding handle, lists at \$18 per dozen and the 3-bit tool at \$6 per dozen.

Rack Adjustable to Any Motor

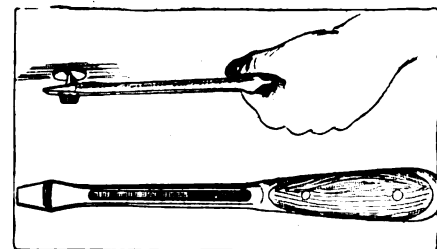
A steel rack that will hold any motor, from four to eight cylinder, in any position while work is being done upon it, is manufactured by the St. Albans Foundry & Implement Co., St. Albans, Vt.

The rack can be moved close to a car and the motor lifted out of the chassis with a chain hoist and set on the rack, to which it is secured by bolts, chains or other convenient means.

The device consists of two standards with a rectangular steel frame for carrying the motor swung between them and having trunnions taking their bearings in the standards. The frame is long enough to accommodate the longest ordinary motor and the width is adjustable by moving the side members in slots in the end pieces. The trunnions are so positioned with relation to the swinging frame that the average motor will be fairly well balanced—that is, there will

not be too great a tendency for the frame to turn under unbalanced motor weight.

The motor frame may be turned by turning a hand wheel which is geared to one of the trunnions; there are two gears and the ratios are such that the heaviest motor can be turned without undue exertion. The frame carrying the



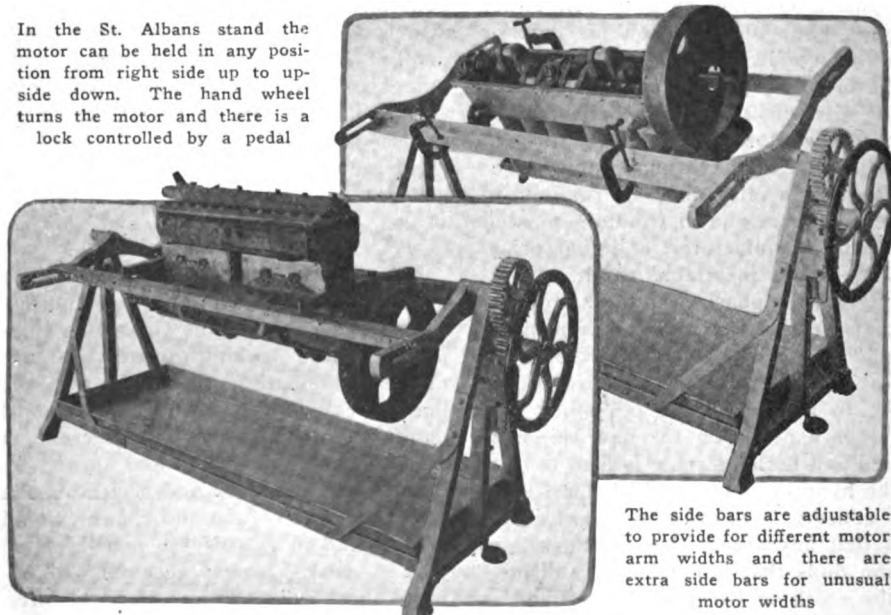
Perfect Handle screwdriver which will work in awkward places

motor can be locked in any desired position; the lock is operated by a pedal, so that the operator can have both hands free for the wheel and set the lock with his foot at any desired point. There are 32 positions in which the motor can be held.

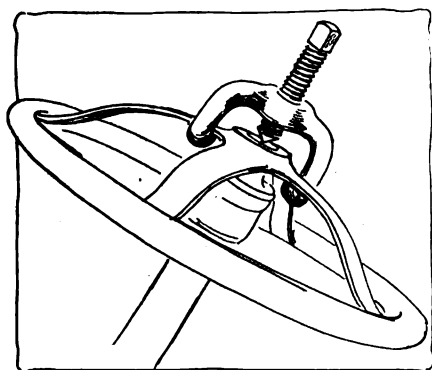
The rack has an overall length of 7 feet; the height is 3 feet and the width 3 feet. The adjustable rails have a minimum spacing of 17 inches and a maximum of 30 inches; extra side rails are provided to make distances $10\frac{1}{2}$ and 30 inches respectively. The total weight is 325 pounds.

The rack described is the largest model. Three others are made, principal dimensions being as follows: Length of

In the St. Albans stand the motor can be held in any position from right side up to upside down. The hand wheel turns the motor and there is a lock controlled by a pedal



The side bars are adjustable to provide for different motor arm widths and there are extra side bars for unusual motor widths



Apco puller for Ford steering wheels, showing its position when in use

motor frame, 30, 40 and 54 inches; minimum width, 10, 10 and 10½ inches; maximum width, 24, 24 and 30 inches.

Randall-Faichney Composite Plug

A spark plug in which the good qualities of both mica and porcelain are combined is manufactured by the Randall-Faichney Co., Boston. The core is built up of an inner foundation of mica over which a shell of porcelain is fitted; the latter protects the former from the action of oil which in time tends to reduce its efficiency as an insulator. A removable unit is formed by the central electrode and the compound core. There are two grounded or shell electrodes

a turbine wheel and then to an expansion chamber with a baffle plate. The idea is that not only is the gas slowed and cooled by driving the turbine, but the rapid rotation of the wheel produced by one explosion causes a suction which helps to clear the exhaust pipe for the rush of gas resulting from the next.

Hudson Band Prices per 1,000

Due to a typographical error in the description in Motor World for March 3 of the Hudson hose menders, manufactured by the Hudson Hose Mender Co., Melrose, Mass., the prices of the menders of the 1-inch size in brass was made \$5.75 per 100, whereas it should have read per 1,000. The correct price list is as follows:

Brass, 1-inch, \$5.75 per 1,000; 1¼, \$6.50 per 1,000; 1½, \$7.50 per 1,000; 1¾, \$8.50 per 1,000; 2-inch, \$9.50 per 1,000; 2¼, \$10.50 per 1,000; 2½, \$11.50 per 1,000. Iron, 1-inch, \$3.25 per 1,000; 1¼, \$3.50 per 1,000; 1½, \$4 per 1,000; 1¾, \$4.50 per 1,000; 2-inch, \$5 per 1,000; 2¼, \$5.50 per 1,000; 2½, \$6 per 1,000. Pliers, \$1.40 per dozen.

The Hudson bands are of wire with hooked ends; they are applied by placing on the hose with ends overlapping and catching the hooked ends with the pliers, which are specially constructed to take the hooks. Pressing the handles together draws the band tight, when the tool is given a half turn, twisting the wire and locking it neatly and permanently.

Puller for Ford Steering Wheels

A simple little tool that makes the removal of a Ford steering wheel an easy matter is manufactured by the Auto Parts Co., Providence, R. I.; it is made of semi-steel and has hooked arms which grip the spokes and a screw which applies the requisite pressure for pulling off the wheel. The job can be done quickly without even marring the paint. Price, 50 cents; dealers, 25 per cent.

Safety Acetylene Generator

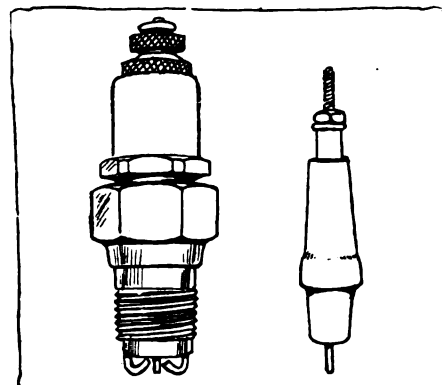
An acetylene generator in which extreme precaution has been taken to prevent the formation of an explosive mixture in the tank and to avoid improper handling is manufactured by the Oxy-Carbi Co., New Haven, Conn., in several sizes, all built on the same lines.

The body of the generator is a cylindrical tank, on the top of which the carbide hopper is mounted. A horizontal partition is placed about a third of the height of the tank from the top; the space above it is the gas expansion chamber and the space below, which is almost completely filled with water, is the generating chamber.

The formation of an explosive mixture necessitates the admixture of a considerable volume of air with the gas, and this is made impossible by the fact that

when the water chamber is to be emptied the gas chamber is isolated from it by closing cocks in the connecting passages, confining the gas in its space; when the tank is refilled the air escapes through a special vent pipe.

The generator is of the type in which the carbide is fed into the water. An unusual feature, however, is that the feed is so arranged that the apparatus can be

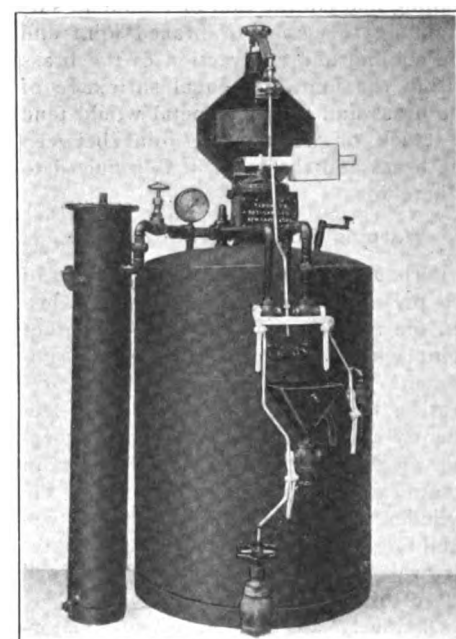


Both mica and porcelain insulation are used in the Blitz plug

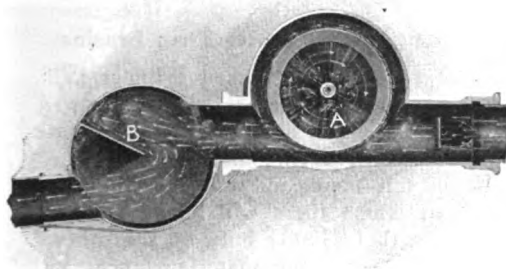
moved around while operating without causing any disturbance of the rate of carbide feed which would bring about the generation of excessive quantities of gas. The feed is controlled automatically by the pressure of the gas.

Safety in operation is made certain by the ingenious arrangement of the various valves; interlocks and interference rods are arranged so that a certain sequence must be observed in their opening and closing. The valves cannot be operated when their operation would bring about undesirable results.

Five sizes are built, having carbide capacities of 25, 30, 50, 100 and 200 pounds.



Acetylene generator designed to be safe and foolproof



The Kellogg Muffler makes the exhaust gas spin a high-speed turbine

which are bent to cause oil that may be deposited on them to flow away from the spark gaps.

The top nut and terminal holder are made from a single piece of brass; should the cable terminal be broken off the wire can be clamped under the nut in the old fashioned way. The price of the plug is \$1. Dealers' prices, Blitz plugs: Single plugs, 70 cents; 1 dozen, 66½ cents each; packages of 25, 65 cents each; in lots of 100, 60 cents each; in cases of 250, 57 cents each; in 1,000 lots, 54 cents each.

Muffler That Makes Exhaust Work

A muffler which takes part of the snap out of the exhaust by making it turn a turbine is manufactured by the Kellogg Mfg. Co., Rochester, N. Y., and consists of a pipe which carries the gas first to

Advanced Maintenance

REPAIRING WATERJACKETS

By George Fernwell



THE danger of warping referred to as being inseparable from some instances of brazing cast iron may be well exemplified in the case of a cracked engine cylinder or waterjacket, which may have been brazed to repair the crack. In this assumed instance it will be necessary before brazing the crack to heat as uniformly as possible the entire cylinder and waterjacket casting to a red heat and to maintain the casting at approximately that heat during the entire process of brazing the crack with spelter.

Preheating Equalizes Expansion

This will be done with the object, in the first place, of expanding the mass of the casting to a degree conforming as nearly as possible with the expanded condition of melted spelter, at the moment when brazing is completed. The main object of this pre-heating is to cause, as the brazed joint cools, a corresponding degree of shrinkage of the brazing medium (spelter), the width or thickness of the crack and the mass of the casting, especially near the brazed joint.

Unequal Shrinkage Weakens Joint

In other words, the preheating is necessary in order to equalize the subsequent cooling and contraction of the metal surrounding the crack or brazed joint and the cooling and contraction of the brass within the joint. Unequal shrinkage of the brass and adjacent metal would tend to crack or weaken the joint between the brass and the metal it is required to adhere to.

Warping Impairs Truth of Bore

Perhaps an equally important object of the preheating of the casting is to lessen the risk of cracking it at some other point while brazing or during the subsequent cooling. Unfortunately, preheating a cylinder and waterjacket frequently results in the distortion or warping of the bore of the cylinder, or in some cases the machined base of the cylinder where the latter would in assembling be bolted to the crankcase; also valve seats or guides may be warped out of shape or alignment.

Obviously any or all of the distortions referred to involve considerable delicate refitting to restore such cylinders to serviceable condition. An in-

stance of refitting requiring great care would be the mounting of a cylinder, warped as a result of preheating for brazing, on a lathe, boring mill or cylinder grinder, with such a degree of exactness that the warped bore might be trued up with the least possible increase in diameter.

Little Preheating for Welding

When instead of brazing a crack is repaired by welding by the oxy-acetylene process, the temperature to which the casting is preheated will not exceed 500 deg. Fahr. At this temperature the cylinder bore, machined base, valve seats and guides are practically safe from serious warping.

Welding Heat Spreads But Slightly

When skillfully performed acetylene welding proceeds rapidly. Also the intense heat of the oxy-acetylene welding flame fuses or melts the metal so rapidly at the actual point of welding that, with dexterous manipulation, it is possible for the welding process to be completed so quickly that comparatively little heat is conducted to or absorbed by the mass of the casting adjacent to the crack. The thinness of the jacket walls also prevents free passage of heat from the crack. In other words, the joint may be heated to the melting temperature of cast iron, while the iron quite close to the joint may not be greatly above the preheating temperature.

Practical Conditions a Compromise

It should not be inferred from the practical degree of success obtained in welding under the above conditions of preheating that these are ideal welding conditions, or that they would be equally

successful in other kinds of welding repairs.

If a perfect weld only had to be considered the entire casting would be heated to a very much higher temperature—that is, more nearly approaching the melting point—in order to obtain a still greater degree of uniformity in the degree of shrinkage of the metal being welded and the new metal which is added to unite the broken surfaces.

Ideal Heat Too High for Practice

But, on the other hand, preheating which would approach an ideal temperature for the natural or unrestrained shrinkage of the weld after completion would be, as stated above, injurious to the alignment of machined surfaces or the bore of a cylinder. This may be made plainer in other instances of repairs by acetylene welding to be discussed later.

Welding Cracks Better Than Brazing

For repairing a cracked cylinder and waterjacket it is necessary to compromise between the high temperature most suitable for ensuring uniform shrinkage on the one hand, and a lower temperature at which there will be no risk of warping the cylinder bore on the other. This is one of the many instances in brazing and welding in which actual experience is of the greatest importance in performing work in a manner which, although conflicting with theory, may meet with a practical success in skilled hands.

The deduction made from the foregoing is that welding is preferable to brazing as a means of repairing cracked cylinders or waterjackets in a permanent manner.

REPAIRING WATERJACKETS BY SOLDERING

Special Process Necessary for Tinning Cast Iron Surfaces

It may be of interest here to describe a means of repairing at least temporarily a crack in a waterjacket by using ordinary soft solder and incidentally without risk of warping the cylinder bore.

Anyone who has attempted to solder cast iron in the ordinary manner of soldering has found it usually almost a hopeless job.

To begin at the beginning, when difficulty is to be expected in making solder unite two surfaces without other special preparation than the use of flux such as sal ammoniac, killed muriatic acid, etc., the direct means to take to ensure success is to coat each surface first with a film of solder; in other words, to "tin" each surface as a separate process prior

to actually uniting the surfaces with solder.

Process That Is Satisfactory

While this has often been fully realized, the workman's first attempt to tin cast iron surfaces as a rule is without success. It being clear that cast iron can be tinned only with the greatest difficulty, it becomes necessary to use some material which will readily adhere to cast iron and so prepare the surface that it may then be readily tinned with solder. The process here described will be found to give satisfactory results.

Applying Paste That Deposits Copper

Thoroughly clean the crack in the casting with a file or scratch brush until the surfaces are actually bright. Also clean a surface adjacent to the crack large enough for a metal patch. Next obtain from a druggist ordinary "blue-stone" or "green copperas." These are two names for the same material. Pulverize the blue-stone into fine powder and mix with water to a paste. Apply paste to the surface of the cast iron where clean, removing all superfluous paste, letting the remainder dry. Apply several coatings of the blue-stone paste in turn, letting each coat dry before applying the next.

Solder Applied in the Usual Way

The condition of the surface then would resemble that of cast iron which had been electroplated with a thin film of copper. Obviously no difficulty would be experienced in tinning a copper-coated surface. With a well tinned soldering iron, and diluted killed muriatic acid not too freely applied, or with powdered sal ammoniac, as a flux, no difficulty should be experienced in successfully tinning the blue-stone coated surface by anyone skilled in ordinary soft soldering.

Soldered Patch Makes Better Job

A crack may be repaired by building up a mass of solder in, around and over the crack or a soft copper or steel patch may be carefully fitted to shape, tipped all over and soldered over the crack; this makes a stronger job than a mere mass of solder. To more effectively tin and solder a crack in a mass of metal, such as an engine cylinder and water-

jacket, it is advisable to gently and uniformly heat the entire casting with a blow-pipe or over a gas stove or charcoal fire. Only a very moderate heat is required, such as will heat the casting to a point where it requires the additional heat of a soldering iron to fully melt the solder during the tinning and subsequently the heat of a small blow-

Notes on Filling Cracks

Risk of warping inseparable from repairing cracks by brazing

Preheating prevents excessively unequal shrinkage on cooling

Welding, involving little preheating, is preferable to brazing

Successful practice sometimes conflicts with pure theory

Soft soldering often is a satisfactory method of filling cracks

Cast iron surfaces must be specially prepared for tinning

Chemically deposited copper makes a good surface for soldering

Aluminum soldering is only a partially developed process

Aluminum solders can be bought ready made or made up to formula

A nickel soldering tool does not discolor aluminum; copper does

pipe or gasoline torch in "sweating" the solder thoroughly through the joint in applying the patch.

Preparing Killed Acid Flux

Killed muriatic acid is readily prepared by pouring a quantity, say a quarter of a pint, of muriatic acid into an earthen receptacle and adding enough small pieces of new sheet zinc to fill about the same space in the receptacle as the amount of acid. Upon adding the zinc the acid will immediately boil violently for a short time, the ebullition then decreasing in violence. As soon as all signs of boiling or bubbling have ceased and the surface of the acid is perfectly still it is ready for use for soldering.

Cracked aluminum crankcases, in which repairing by welding necessitates preheating of the entire casting, involve even more risk of warping than welding cracked cast iron cylinders and water-jackets.

Ready-made Aluminum Solder

As far as is known at present an aluminum solder has not been devised having the initial strength and subsequent durability required for such work as crankcase repairs. Partial success has been obtained, however, with the use of various alloys, some of which are marketed ready to use; others are of compositions available to the workman who desires to try out their possibilities for himself. Of the ready made aluminum solders probably the best known is called Richard's Alloy, which it is stated is composed of 22 parts tin, 11 parts zinc, 1 part aluminum, 1 part phosphor tin. It is claimed that no additional flux is required in using this alloy, the phosphorus content having the required action of cleaning the surface of the joint from aluminum oxid.

Nickel Tool Best for Aluminum

Another means is a process of using chloride of silver together with ordinary soft solder. Some success has been attained by this means. The process is patented.

A soldering iron made of nickel has been found preferable to one made of copper for the reason that nickel does not discolor the surface of the aluminum.

Endurance of Joint Dubious

It must be understood that even if the difficulty of uniting aluminum with a solder were overcome there still remains the question of endurance of the joint. Other metals than aluminum used in the alloy or solder are more or less injurious to aluminum. Tin in particular is believed to render the joint and adjacent aluminum brittle and rotten in a short time after the repair.

(To be continued)

Recently, F. E. Davidson, a New York repairman, had to straighten a bumper made from brass tubing; it had a large dent in the center, indicating that the bumper had passed through a period of very active service.

Instead of taking the trouble to remove it and going through the usual process he hit upon the simple scheme of tying one end of a stout rope to the bumper and the other end to a post. Then he started the motor and backed the car up slowly until the bumper was perfectly straight. It took him five minutes to do what would ordinarily take an hour or two. The use of the reverse gears gave a strong pull and at the same time a slow movement which did not involve risk of bending the bar too much.

PROBLEMS INVOLVED IN ALUMINUM SOLDERING

Crankcase Repairs Present Difficulties—Available Solders

Before leaving the general discussion of that class of work which is performed at or near brazing temperature, some consideration should be given to the subject of soldering aluminum.

Crankcases Warp in Preheating

Numerous attempts have been made to devise a successful aluminum soldering

method which could be used in a similar manner to ordinary soldering and with the equivalent to a soldering iron.

A solder which could be used to successfully and permanently unite aluminum at the comparatively low temperature of ordinary soft soldering would be very desirable both for manufacturing and repairing, especially the latter.

Dealer Supply House

The RETAIL NEWS



Garage Repair Shop

The Seven Seven Co., distributor of Dodge cars in Spokane, Wash., and throughout the Inland Empire, had a unique exhibit in their show window during show week, namely \$4,500 worth of checks, 90 in all, which were drawn for local sales in the Inland Empire. These cover one side of a car and have all been received within the past three months, says Manager Hal G. Childs.

Harry Hawkins, formerly agent for the Baker electric, and **Harry Twitchell**, of the Spokane Hudson agency, have formed a new firm which will be known as the **Hawkins-Twitchell Auto Co.** It will handle the Hudson car and the Federal truck exclusively in the Spokane territory. They will occupy the large new garage building at S122 Walnut street.

C. A. and R. S. Murray, Tomah, Wis., have purchased the business and property of the Tomah Iron Works & Garage and are making extensive changes, additions and improvements, particularly in the mechanical department, which will be in charge of **George Cousine**, until now with the Totten Motor Co. of Rock Island, Ill.

The Parker Motor Car Co., Seattle, distributor of Pullman cars, has appointed the following subagents: **Mt. Vernon Auto Co.**, Mt. Vernon, Wash., and Skagit county; **Automobile Repair Co.**, Everett, Wash., and Snohomish county; **Service Garage & Supply Co.**, North Yakima, Wash., and Yakima county.

R. L. Hooker and L. Kittell, Green Bay, Wis., have resigned their positions as locomotive engineers on the North-Western line to open a garage at 313 North Monroe avenue under the style **Sphinx Garage**. The company will represent the Sphinx and do a general garage and repair business.

Butzer Brothers, Studebaker dealer at Scranton, Pa., has just approved plans for a fireproof salesroom and service station. The show room will be 80 x 60 feet. There will also be a machine-shop and automobile storeroom, 80 x 80. The entire building will be devoted exclusively to sales and service.

Elmer W. Brown & Co., Detroit, recently organized to handle automobile supplies, is now located at 967 Woodward avenue. The company has been appointed distributor for Diamond tires. **E. W. Brown** is president; **O. H. Dawson**, vice-president, and **C. Rasmussen**, secretary-treasurer.

The Bunce-Crane Co., Detroit, has been organized by **E. M. Bunce** and **Charles S. Crane**, with headquarters at 851 Woodward avenue, to handle the Enger cars. The concern has all of Michigan for its territory and will appoint agents and subagents in all important localities.

The Keystone Garage Co. has been or-

ganized at Monongahela City, Pa., by **D. M. Swickard**, **William M. Ross** and **Harry R. Downer**. They have taken over the old Monongahela Garage on Chess street, which was until recently managed by **Philip Ginsberg**. The new company has the agency for the Jeffery car and trucks.

The J. G. Duncan, Jr., Co., Philadelphia, official L B A battery distributors, has opened a service station at 1311 Race street in addition to the one already maintained at 131-133 South 24th street. The company makes a specialty of renting service batteries while car owners' batteries are being recharged or repaired.

The R. & W. Auto Co., 1127 Tacoma avenue, has opened the first cash repair shop in Tacoma. **C. R. Wilson** is in charge of the mechanical department.

Jack Haswell, of the Tacoma Motor Car Co., Tacoma, in addition to handling the Maxwell line has added the Chandler.

The Westinghouse Electric & Mfg. Co. has opened a department for automobile equipment at 2025 Euclid avenue, Cleveland, O., with a thoroughly equipped sales and service station. **S. L. Blackburn** is district manager in the southeastern territory for the company.

William Schultz has purchased the interest of **Jacob Harder** in the **Schultz-Harder garage**, Columbus, Wis., and on March 1 will take occupancy of the **Schmidt garage**, where the business will be continued. **Harder** intends to establish a garage at some point in Iowa.

John S. Ingram, president of the Eastern Motor Co., Atlantic City, N. J., has just acquired **Johnson's Garage** on Ohio avenue near Atlantic. **Ingram** is establishing a first-class Studebaker service station. His son, **Nelson H. Ingram**, will have charge of the garage.

Louis Bushing, Waterloo, Ia., will establish a garage in **Prairie du Chien**. He has leased half of the **Dousman block** and will make a feature of repair work. In addition, he will represent the **Franklin** in a number of Western Wisconsin counties.

W. L. Peeler, proprietor of the **Crown Garage & Machine Works**, Corona, Cal., Studebaker dealer, recently gave a complimentary banquet to Studebaker owners in his town. Covers were laid for 60 guests, including visiting Studebaker officials.

Harry Bland has resigned as president and secretary of the **Blue Ribbon Garage**, Springfield, Mass. **W. I. Stearns** has joined the sales force of the **Blue Ribbon Garage Co.** He was formerly connected with the **Buick Springfield branch**.

The Lincoln Automobile Co., Somerset, Pa., has received a Pennsylvania charter. It has a capital of \$10,000. The incorporators are: **R. L. Richardson**,

of Johnstown; **Harvey E. Stahl**, **J. T. Bowman** and **W. J. Phillips**, of Somerset.

John R. Graham, assistant manager of the Syracuse automobile show, plans to establish a retail and jobbing supply business in Syracuse; he will locate at 425 Clinton street and will specialize in tires, tubes and a starting and lighting system.

The Brownsville Taxi & Transfer Co., Brownsville, Pa., has been organized to run a line of automobiles between Brownsville and South Brownsville. **Playford & Phillips**, of Brownsville, Pa., are interested in the company.

O. H. Boylan, secretary and treasurer of the **Kalamazoo Implement Co.**, Kalamazoo Studebaker dealer, has purchased the interest of **Geo. E. Bayle**, the former Studebaker dealer in Kalamazoo. He will establish a service plant.

F. W. Ackerman and Henry Rolfs, West Bend, Wis., have formed a partnership under the style **West Bend Plating & Mfg. Co.** to do a general plating and machinery business, catering especially to the motor car trade.

The Beechwood Garage, Inc., Pittsburgh, is a new retail automobile firm which is located in the Beechwood district and is composed by the following men: **W. G. Blanchard**, **C. E. Hampton** and **Furman South, Jr.**

W. W. Sheane, of the **Central Auto Co.**, and **W. D. Baker**, of the **Baker Motor Car Co.**, North Yakima, Wash., have combined business interests and will operate under the name **Central Auto & Supply Co.**

Rothweiler & Co., Seattle, Wash., Ford dealer, has been named as distributor of the **Cole** in King county north of Auburn, Wash., and the counties of Skagit, Snohomish, Whatcom and Kittitas in the State of Washington.

The Pioneer Automobile Co. has been organized in Mayville, Wis., by **Orville Hurlbert**, **Frank Bauer** and **Alvin Butter** and established a garage on North Main street. The new concern holds the Dodge agency.

The Bunce-Cuson Co., Detroit, which handled Krit cars, has been dissolved. **Cuson** is now with the service department of the bankrupt Krit Motor Car Co. and **Bunce** is handling the Enger cars.

H. H. Bierman has resigned as manager of the **Springfield Buick Co.** and has formed the **Springfield Reo Co.** with **H. P. Gates**. **George A. Mevis** has been appointed manager of the Buick agency.

The Madert Sales Co. has taken the agency in Massachusetts for the **Dart truck** and has arranged to exhibit them at the salesrooms of the **Worcester Motor Car Co.** Worcester, for the present.

The Chambersburg Automobile Co., Chambersburg, Pa., under the manage-

ment of D. G. Pfoutz, has done away with its repair branch and garage and will devote all its time to the sale of new and used cars. It has relinquished its garage on King street, which has been taken over by Hayes Pensinger, who will conduct a repair-shop and garage.

Karl Sharp has disposed of a half interest in his garage and sales business at Mauston, Wis., to Fred Denicke, and the firm will henceforth be styled Sharp & Denicke. A new garage, 65 x 92 feet, of fireproof construction, will be erected in the spring at LaCrosse and Division streets.

W. B. LaMay, for many years connected with the Anderson Electric Car Co., has located in Seattle, Wash., and opened an automobile clearing house at 1708 Broadway, under the style Auto Clearing House; its activities will be confined to buying and selling used cars.

McDermott & Berryman, who have been conducting a blacksmithing and machine shop at Shullsburg, Wis., for several years, are installing additional equipment and power tools and will make a specialty of motor car work. A small garage will also be operated.

John L. Rudolph, who has been conducting a garage at Courtney, N. D., for several years, has purchased the City Garage, Cashton, Wis., and will take immediate possession. The garage formerly was conducted by Fred Heiser but for some time has been idle.

Albert C. Rea, Jefferson, Wis., for 11 years an erecting engineer for the Allis-Chalmers Mfg. Co., of Milwaukee, has resigned to engage in the garage business at Libertyville, Ill. He has taken the Studebaker agency.

The William Penn Garage Co. has been organized by Joseph Mazer, William Fisher and Harvey M. Aronson, of Pittsburgh, and will establish a garage soon to rebuild, repair and hire out automobiles.

J. H. Battell, proprietor of the Ripon Auto Co., Ripon, Wis., has made an installation of welding and cutting equipment and is otherwise enlarging the facilities of his garage and repair-shop.

F. H. Johnson and E. O. Hayes have formed a company in Boston to handle the Pilot car and have secured salesrooms at 911 Boylston street vacated recently by the Michigan agency.

The Ohio Motor Sales Co., Pittsburgh, has changed its name to Jones Motor Co. and is now managed by J. C. F. Jones. The company handles the Crescent and Famous Light car.

Heath & Carpenter, Inc., Detroit, has started in the accessory business at 208 Jefferson avenue, handling Witherbee batteries, Newton horns and a full line of Firestone tires and accessories.

I. F. Case and R. C. Blake will open a new sales agency at Conneaut, O., on Washington street, April 1. They will handle the Allan, Chalmers and Saxon cars and the Brockway truck.

Spitzer & Healey have opened salesrooms in Scranton and Wilkes-Barre, Pa., for the Inter-State. Both are sons of brewers. Their address in the latter town is 125 Water street.

John H. Davis, Studebaker dealer at Bridgeton, N. J., who has been a patient at Jefferson Hospital, Philadelphia, is fast improving and hopes to return to Bridgeton in a few days.

The Standard Auto Sales Co. is a new retail concern at Derry, Pa., which has the agency for the Hupmobile and also

the Dodge cars. It will build a garage on 4th avenue soon.

The Singer Motor Co., Long Island City, N. Y., has taken a showroom at the northeast corner of 61st street and Broadway, New York. The store was opened February 22.

Frank Schultz, operating a garage at 916 Forest Home avenue, Milwaukee, has filed a voluntary petition in bankruptcy, scheduling assets at \$8,099 and liabilities at \$5,692.

James Wells and J. P. Loomis, Akron, O., have leased a 55-foot frontage on East Market street in that city and will provide a large garage for the White Motor Sales Co.

H. K. Gearhart, J. W. Harshman and R. H. Petrie, Waynesboro, Pa., are starting an automobile bus line to connect Waynesboro, Leitersburg, Pa., and Hagerstown, Md.

Paul & Rosenberg, Colfax, Wis., are making plans for the erection of a garage at Pine and River streets, to be 60 feet square and of reinforced concrete construction.

Leon Herpick, Union City, Pa., has bought a one-half interest in the Star Garage on West High street and will continue business under the style the Star Garage.

The Metz Co., Waltham, Mass., has opened a factory branch at 645 Main street, Waltham. H. I. Kidd has been made manager, with J. L. Hackett as his assistant.

The Saxon Motor Car Co. has been formed at Providence, R. I., to handle that make of car there and salesrooms have been opened at 82 Matthewson street.

George J. Mercier, Indianapolis, and C. D. Cranford, East Liverpool, have opened a repair-shop in the Arcade building at 433 Walnut street, East Liverpool.

Joseph W. Hofer, Antigo, Wis., is establishing an agency and garage business and has contracted for the Maxwell agency for Langlade county, Wis.

Artemis Rentz, Reynoldsville, Pa., and George R. Osborn are now managing the Central Garage and will have a fully equipped repair department this summer.

Wosika & Powser have opened the Square Deal Auto Garage at 5610 Union avenue, Tacoma and will make a specialty of buying and selling used cars.

Glenn A. Hill, Ripon, Wis., has taken the agency for the Ford and Overland in Green Lake county and has established a garage and salesroom in Green Lake.

Draper Van Fossen and F. C. Wood, Pinesville, Pa., have organized the Pinesville Auto Repair Co. and will build a garage at Columbus and Oak streets.

E. H. Ramm, the leading hardware dealer in New London, Wis., will build a large fireproof garage, 46 x 81 feet in size, two stories high, in the spring.

The A. L. M. Motor Sales Co., Inc., Metropolitan distributors for the Westcott Motor Car Co., has opened New York salesrooms at 1677 Broadway.

J. A. Murbach, Almira, Wash., has signed a contract with the Spokane Auto Co. and will take the agency at Odessa, Wash., for the Oakland.

Prosser & DeKay, Cuba, N. Y., have just secured the Studebaker agency. Their service station will be located at Guilford Bros.' Garage.

The Keystone Auto Sales Co., New Castle, Pa., has bought property on Cro-

ton avenue and will build a modern two-story garage, 48 x 150.

William Wooster, 1657 Broadway, New York, has purchased the stock of accessories of the Mutual Automobile Accessories Co., New York.

The Kidder Garage Co., Newport, N. H., has taken the Ford agency for Newport, New London and adjoining towns in New Hampshire.

Walter I. Smith, Fair Haven, Vt., is building a new brick garage, 40 x 85 feet. It will be two stories high and has modern equipment.

A. E. Knaak, who recently was appointed agent for the Case in Fall River and vicinity, is establishing a garage and service station.

A. M. Gogin, Red Granite, Wis., is having plans made for a fireproof garage, 33 x 90 feet in size, for occupancy by Charles Byse.

The B. F. Goodrich Co.'s branch in Syracuse, N. Y., has been moved from 423 South Clinton street to 115 West Taylor street.

The Valvoline Oil & Refining Co. has entered the new auto row in San Francisco, on Van Ness avenue. T. J. Finch is manager.

Ole G. Kinney will start construction work on a new garage about March 15, giving Colfax, Wis., two modern buildings.

The Mound City Auto Co., Moundsville, W. Va., is laying foundations for a garage 40 x 100 feet on Tomlinson avenue.

J. Gilbert Thomas and Horace MacDowell, Pennsburg, Pa., have secured the agency for the Sphinx cars in that district.

A. B. Cheny, formerly with the Elmore Co., has purchased a half interest in the Augusta Vulcanizing Co., Augusta, Ga.

The Pathfinder agency is now located in new salesrooms at 1127 South Olive street, Los Angeles. A. E. Reid is agent.

The Knight Tire & Rubber Co. has moved its New England branch from 153 to 179 Massachusetts avenue, Boston.

Madison Bros. have opened a store at 137 Broadway, Newburgh, N. Y., carrying a full line of tires and supplies.

The Ironton Garage Co., Ironton, O., has bought a plot 88 x 212 feet and will build a three-story garage at once.

H. S. Allen, Sandpoint, Idaho, closed a contract with Hawkins-Twitchell Co., Spokane, to handle the Hudson.

The Loucks Motor Co., Scottdale, Pa., has started work on a fine commercial garage on South Broadway.

Fred E. Fischer and E. H. Rummes, Warren, O., have opened a repair-shop at 116 East Franklin street.

George P. Barnum, Kenrick, Idaho, is erecting a garage to be used by the Kenrick Automobile Co.

D. McLaughlin, Reardan, Wash., has been made distributor of the Hupmobile in that territory.

The Stutz Motor Car Co. is now in new quarters at 12th avenue and East Pine street, Seattle.

Charlton & McInnis are now representatives of the Ford car at Harrington, Wash.

The Longley Motor Sales Co., Providence, R. I., has taken on the Monroe car.

The Bunce-Cuson Co., which handled the Krit in Detroit, has dissolved.

Jitney Movement Gains Force

Kansas City to Float Interinsurance Proposition Covering the Country—Milwaukee Has 57 Owners of Jitneys in Service—Many Associations and One Union of Drivers Formed

The Kansas City Jitney Association has undertaken to solve the hardest problem of jitney operation—that of insurance. A company, or organization, is now being formed that will insure jitney owners in all cities of the United States against property damage and injury to persons.

When the jitneys started there were practically no stock company insurers which would write them for liability. Later several companies authorized agents to write, but the nature of the risk was such that the local agents refused to take the business.

A liability man has been employed to draft a form of policy and outline the plan of organization and procedure, and this plan is now ready for exploitation. Actual writing will not begin until a sufficient number of subscribers is assured.

The proposed interinsurance organization will be known as the Jitney Service Indemnity Exchange of America. It will protect jitney owners from liability claims for property damage and injury to persons. Its tentative plan provides for placing sufficient responsibility on the owner and driver so that the exchange itself will be protected against carelessness on their part.

One of the requirements for participation in the Exchange is that every member must be a member of a jitney association, so that the association itself may have authority over his schedules and conduct, and the Exchange may receive the benefit of the regulations of the associations. Subscribers must in addition pass an examination by the Exchange as to their knowledge of traffic rules in the cities where they operate, and as to their efficiency as drivers.

Milwaukee Plans Transfer System

In the short space of one month Milwaukee's jitney bus industry has grown to comparatively enormous proportions and hardly a day passes without the issue of at least one license to operate a bus. The jitney bus owners have already formed an association for mutual benefit and are even now planning a system of transfers for interchange of passengers.

On March 15 the city of Milwaukee

had issued licenses to 57 owners of cars for jitney service. The license costs \$10 annually and is the same as for taxicab and other car-for-hire operation.

About 50 per cent of the jitneys in operation in Milwaukee are Fords. The list of machines shows nearly 40 different makes, among them two Wintons, two Locomobiles, two Mitchells, three Ramblers and other makes of considerably higher power and more weight than the Ford. Several Ford jitney operators claim to average a gross revenue of \$25 per day of 12 hours.

On one route, State street, from the western city limits to the North-Western lakeshore depot, there are 21 jitneys. This route is most popular because of the poor service given by the local street car system.

So far as can be ascertained, the \$100,000 jitney bus corporation organized two weeks ago, as reported, has failed to carry out its plans of placing a large number of cars on the streets.

There are few persons in Milwaukee who do not agree that the jitney has made serious inroads upon the traffic carried by electric railway systems, of which there is but one to be reckoned with as a factor. If the association of jitney bus owners accomplishes the purposes it has laid out, the jitney will become a strenuous competitor of the street railway instead of only a thorn in its side, as now.

New Orleans Owners Organize

More than 100 New Orleans jitney bus owners met last week and formed the Jitney Owners' Association, the following officers being elected: President, Dan W. Fietel; first vice-president, Herbert K. Smith; second vice-president, Mrs. B. Malczewski; third vice-president, Mrs. Gress; attorney, Nathan Feitel; secretary, Herbert B. Mayer; assistant secretary, C. A. Younger; treasurer, Patrick Adams.

Philadelphia Lets Down Bars

City Solicitor Michael J. Ryan has issued an announcement advocating the establishment of motor bus lines in Philadelphia as a solution of the transportation problem, at the same time declaring

that no legal obstacles bar the way. With the exception of the ordinances and regulations governing horse cabs and taxicabs, there is nothing to prevent independent jitney bus owners working over regular routes all over the city. Fortified with the city solicitor's opinion on the subject, it is expected that another week will see the city honeycombed.

Philadelphia's First Jitney

The jitney bus has arrived in Philadelphia. It made its introduction in the form of a single five-passenger car operated by E. W. Hambright, which runs from the City Hall north on Broad street to Diamond, about 2½ miles, and return. Labelled "5c—Jitney Bus, Stops Anywhere—5c," it is the only one of its kind today, but in a couple of weeks it is expected that this city will be alive with them.

Rock Island Service Increased

Mrs. N. S. Johnson, Rock Island, Ill., has placed a jitney bus in service between Rock Island and Davenport. F. D. Henry, of Davenport, who has two cars in operation, will purchase two more which will hold from 20 to 30 people. The automobiles of the smaller type now in operation cost \$2.50 per day to operate, which includes gasoline, oil and wear and tear. All of the persons operating jitneys claim to be making money.

Rock Island Drivers' Union

The first union of jitney bus drivers has been formed in Rock Island, Ill., and includes 22 drivers in charge of cars running between Rock Island, Moline and Davenport. The union will come under the jurisdiction of the International Teamsters, Chauffeurs and Stablemen's Union. The following officers were elected: President, Chester Staup; recording secretary, William Dickman; financial secretary, L. S. Massick; treasurer, William Gable. The buses are all reporting a thriving patronage and are cutting heavily into the street railway receipts.

Organize Maine Jitney Company

The Jitney Transportation Co., Portland, Me., has been granted a certificate of organization to engage in all kinds of transportation by means of automobiles. P. F. Morse is the president.

Jitney Line For Rochester

A charter has been granted to the White Star Jitney Line, Rochester, N. Y., with a capital of \$50,000. The incorporators are Wm. Cross, W. J. Dever, G. V. Kondolf, all of Rochester.

Motz Tire Prices Reduced 20%

The Goodyear Tire & Rubber Co., which has taken over Motz tire sales, has made a 20 per cent reduction in prices, effective March 1.



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The Selling Factor

The following editorial, which is reproduced from **MOTOR WORLD**, of February 21, 1901, makes plain the potent influence which the salesman had on the motor car industry even in those infant days of the automobile. And if this link in the chain was of such great importance at that time, think how much more important it must be now—now, when competition is keenest and cars are sold on their merits, not because they are luxuries, but because they are necessities, and as such are purchased on still closer margins.

THE best vehicle or motor ever built will prove a failure in the hands of a bungling salesman, while the poorest of these products stands an excellent chance when handled by a salesman who is a salesman in fact as well as in name.

Despite trusts and the political wails about the extinct chances of our Absoloms, there still continues to be ample room at the top, and in these days of business enterprise the premium paid for brains is higher than the world has ever known.

The representative of any business is, if he expects to make himself valuable, of necessity compelled to keep abreast of the times in more respects than one. It is not sufficient that he has at his fingers' ends the details of his business, but he should be able to talk intelligently on almost any subject which may come up for discussion.

Character Study Needed

Among the customers he is brought in contact with he will find many different characters. To study the weak and strong points of these characters is of necessity a part of his duty, and the careful and ob-

serving salesman will find his work growing less arduous daily by a careful attention to this very important part of his profession, for a profession it is; and to be able to succeed in it is just as deserving of praise as success in medicine, law or any other line which comes under the head of professions.

The successful salesman is the one who is a good talker on occasions, but who also understands the art of being an eloquent listener, and who is absolutely truthful. He must enjoy the confidence of his customers, and that can only be obtained and retained by undoubted merit.

Enter Into Their Lives

He must not be satisfied with selling a carriage to his customers, but must enter into their lives, give them the benefit of his knowledge and experience to advance their enjoyment of their purchase. He must inculcate the need of a thorough knowledge of the vehicle, its use, care and maintenance.

These in substance are what the manufacturer should consider index fingers to success in his selling representative, and the salesman who observes them will have added many per cent to his chances of ultimate success, and will leave a record behind him which will be pointed to with pride and satisfaction by his employers, and motovehiclism in general will have been made better by his having labored therein.

Show Decoration Pays

SEVENTY-FIVE thousand dollars is a lot of money to spend in setting up a motor car show; it is a considerable sum for an association of dealers, but this is what the Boston dealers had spent up to the hour the show opened; expenses incurred during the week of the show are not included in the figure.

But spending money to get more money—which is the announced policy of some of the Hub's dealers—is also the policy of the promoters of the show; the expenditure of this \$75,000 results in a decorative effect which is not equaled at any other affair of such big proportions and probably is not approached by any of the lesser events in the small towns and cities.

Real Scene of Beauty

The Boston show was profusely trimmed; flowers and foliage were everywhere; canary birds sang in the branches; brilliant paintings adorned the walls even in the basement where the trucks were housed; bands and orchestras added to the effect, and the show was the showiest of shows.

This showy element is one of the things upon which the Boston exhibit has built its reputation; even if one did not care to view the cars and allied products it was worth a long journey just to view the showy aspect. The beauty of the exhibition arouses comment—great comment. True, it cost \$75,000—but it pays.

APPELLATE COURT AGAIN RULES FOR HESS-BRIGHT

Denies Defendant's Motion for Rehearing on Accounting—Follows Earlier Decisions in Bearing Case

Affirming the decision of the Philadelphia circuit court of appeals in favor of the Hess-Bright Mfg. Co. handed down last October in its suit against Fichtel & Sachs, and refusing the motion for a rehearing as to the right of an accounting made by the latter, the U. S. circuit court of appeals for the third circuit has issued an order as follows:

"The motion for rehearing has had our joint consideration. The defendant firm was formed but a short time before this suit was brought and is only liable to account for the period subsequent to its formation. Bearing in mind the several prior cases against others in which the rights of the patent here involved were rigorously prosecuted and the not undue time that elapsed between the successful termination of such litigation and the commencement of this suit, we do not find any such delay as should preclude the plaintiff from the customary accounting. The defendant firm volunteered to enter the field of infringement and accounting is a necessary consequence of its act. As to the other matters involved, we see no reason to depart from the conclusion reached and stated in the opinion heretofore filed. The motions are therefore refused."

The suit was brought in 1913 by the Hess-Bright Mfg. Co. of Philadelphia and the Deutsche Waffen und Munitions Fabriken of Germany against Hedwig Fichtel and Ernst Sachs, doing business under the firm name of Fichtel & Sachs, charging infringement of the Conrad patents Nos. 822,723 and 838,303, covering the use of a continuous race in a ball bearing. The patent is owned by the Deutsche Waffen und Munitions Fabriken, the Hess-Bright company being exclusive licensee in America. Judge McPherson in the U. S. district court of Philadelphia handed down a decision in favor of the defendants in December, 1913, but on the appeal the Philadelphia circuit court of appeals reversed this decision and gave the verdict to the Hess-Bright company, holding the Conrad patent covering a continuous race in a ball bearing to be valid and infringed by the F. & S. bearing. Then the F. & S. interests petitioned for a rehearing as to the right of an accounting which has now been denied by the circuit court of appeals for the third circuit.

Christian Made Holihan Manager

The Holihan Mfg. Co., Detroit, has appointed William Christian general manager in place of James A. Holihan, who recently resigned.

At the annual meeting of the stockholders of the Vacuum Oil Co., Rochester, the following directors were elected: C. M. Everest, Edward Prizer, G. P. Whaley, C. E. Bedford, C. C. Campbell, W. M. McGee, C. E. Arnott, R. W. Everest.

Moves Detroit Offices

The Detroit sales office and service station of Byrne, Kingston & Co. has been removed from 650 Woodward avenue to more commodious quarters at 870

Woodward avenue. Moore Kelly, the Michigan representative of Byrne, Kingston & Co., will continue in charge.

May Discharge Union Men

That an employer may refuse to employ and may discharge a man for belonging to a union has been held by the Supreme Court. The Kansas coercion statute, so-called, making it unlawful for any individual or corporation to coerce or influence any person to enter into an agreement not to join or remain a member of a labor organization as a condition of such person securing or continuing in the employment of such individual or corporation, was annulled as unconstitutional by the Supreme Court.

The decision, which is regarded as of the first importance in the labor world, was announced by Justice Pitney. The case was that of T. B. Copping, a superintendent of the St. Louis and San Francisco Railway at Scott, Kan., convicted of violating the law in threatening A. R. Hedge, a switchman, with discharge if he did not sign an agreement to withdraw from the Switchmen's Union.

The other laws which, according to Justice Day, are invalidated by the decision, are those of California, Colorado, Connecticut, Indiana, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Oklahoma, Oregon, Pennsylvania, Wisconsin and Porto Rico.

J. A. Holihan, who was president of the Holihan Mfg. Co., radiator manufacturers, is now with the McCord Mfg. Co., builders of automobile radiators.

COURT UPHOLDS HANLON'S CLEAR VIEW WINDSHIELD

Grants Injunction and Decrees and Estimate of Damages—Holds Inventor Solved Troublesome Problem

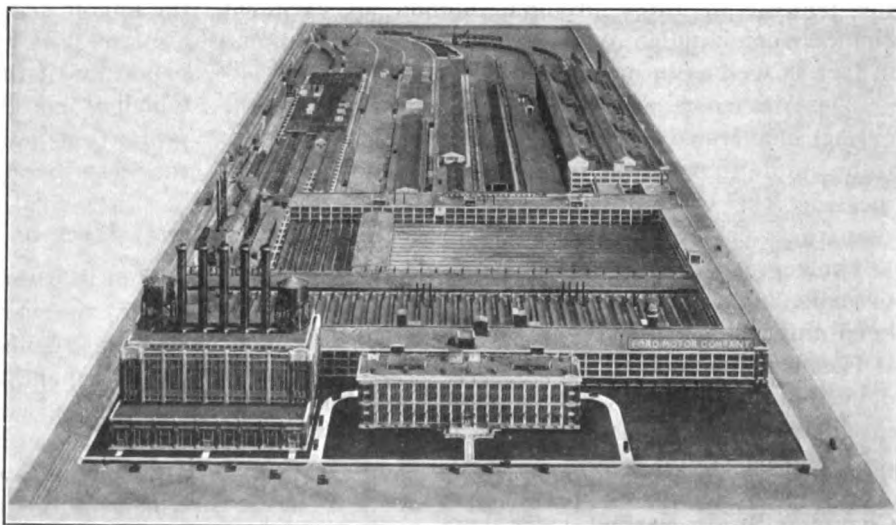
In sustaining the complaint of William D. Hanlon against the Rauch & Lang Carriage Co. and the National Automobile Chamber of Commerce as co-defendant, charging infringement of a windshield patent, Judge John H. Clarke, Cleveland, granted an injunction and passed the case on for an estimate of damages.

"Infringement is claimed in the reissued patent No. 13,653," Judge Clarke's opinion reads, "for the patented device of the independent glass rain panel, hinged at the upper edge and mounted in front of the windshield. The problem which Mr. Hanlon undertook to solve is really an important one of providing a clear view for the driver for a fast moving motor car. The only question the court thinks important is whether the claims of the patent involve the degree of novelty which the law requires."

The evidence shows a painstaking search concerning prior construction and results in the counsel for the defendant placing reliance in the argument for a prior state of art, claiming Hanlon made no discovery on Faulkner's British patent in 1908 and on the Didier French patent in 1906. "It is obvious from the descriptions that these patents did not wholly solve the problems Mr. Hanlon undertook. Clearly Hanlon was the first to conceive the construction, accomplished his aim, and I cannot doubt that it shows the ingenuity and value intended to be rewarded by the patent law. I therefore conclude that the patent is valid and the plaintiff entitled to the relief requested."

It is pointed out that where the visor of the windshield is made stationary no infringement exists.

MINIATURE FORD PLANT FOR DISPLAY AT EXPOSITION



A miniature Ford Motor Co. plant was recently completed by the factory employees and is now on exhibition at the Panama-Pacific Exposition in San Francisco. This replica of the giant Highland Park plant is made of metal, and in addition to showing the various buildings and the new power house, now almost completed, has

duplicates in miniature of the seven engines which generate the 45,000 horsepower of that plant. These little engines are running and illuminate the entire plant by electricity. The reproduction has been made on a scale of one-sixteenth of an inch to the foot. The size of the plant is 2,640 feet in depth and 960 feet in width.

NEW PRICE OF \$4 FOR MODEL F SPARTON HORN

No Alteration in Construction Though
Finish May Be All Satin Black or
Black and Nickel—Due to
Quantity Production

Without in the least altering the construction of its model F hand-operated Sparton horn, the Sparks-Withington Co., Jackson, Mich., has reduced its price from \$4.25 to \$4. At the same time, the horn hereafter will be furnished in either all black satin finish or in black and nickel finish. The horn is supplied with a rigid supporting arm ready to be attached and can be operated by the hand, elbow, foot or knee. A screwdriver is all that is required to make the installation.

"Quantity production is the reason for the reduced price," says Wm. Sparks. "We have hammered costs down to the last notch. Our business is 57 per cent ahead of this time last year."

Look to Lozier Reorganization

Before the end of this month final reorganization of the Lozier Motor Co., Detroit, will be effected and a \$5,000,000 concern organized. This is the plan of the purchasers of the assets of the old company and for that purpose there will probably be issued \$3,000,000 common stock and \$2,000,000 preferred stock.

There have been many conferences between the Lozier purchasers and bankers and capitalists in New York, Detroit and Chicago, and the Detroit Trust Co., trustee. Provided certain agreements made with the latter concern are fulfilled, it may be a matter of only a week or ten days before the announcement of the final organization is made. The Associated Lozier Purchasers, which was organized and incorporated with a capital stock of \$24,000, as a temporary working company, will be absorbed by the new concern.

Michigan Garagemen to Organize

For the purpose of forming an association of garagemen in Michigan a convention has been called for May 22 at the Hotel Statler, Detroit. L. C. Steers, of the Detroit Garage and Station Operators Association, is provisional secretary; his address is the 518 Garage, 518 Grand River avenue. The convention will open in the morning, luncheon will be served in the hotel at noon, and the session will conclude with a banquet.

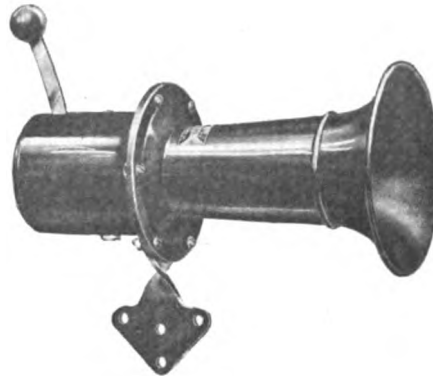
New York Garage Directors to Meet

The Board of Directors of the United Garage Associations of New York State will meet today, March 17, in Albany, for its first meeting since the completion

of the organization of the association March 3. At this time it is anticipated that the board will authorize the Executive Committee to transact business in the absence of a quorum of the board.

Banta President of Portland Dealers

At the weekly meeting of the Portland (Ore.) Automobile Dealers Trade Association the following officers were



Model F hand-operated Sparton, which now sells for \$4 in two finishes

elected: President, H. J. Banta; first vice-president, W. S. Dulmage; second-vice-president, W. C. Garbe; reelected secretary, Jack Crittenden; reelected treasurer, Frank C. Riggs.

Mansfield Tire Takes Over Columbiana

The Mansfield Tire & Rubber Co., Mansfield, O., will take over the plant of the Columbiana Tire & Rubber Co. and a new company to take the name of the old Columbiana company will be formed, with the officers of the Mansfield company at its head.

Herbert Heads Philadelphia Dealers

At the annual election of the Philadelphia Automobile Trade Association, held March 10, the following officers were elected: President, William P. Herbert; vice-president, J. C. Bartlett; secretary and treasurer, J. E. Gomery.

Wahl Plant to Massnick-Phipps

The Massnick-Phipps Mfg. Co., Detroit, maker of the Perkins four- and eight-cylinder motors, has secured the plant of the former Wahl Motor Co., providing an additional 30,000 square feet of floor space and making the total more than 65,000 square feet. The working force will be increased to 500 men and the production increased from 50 to 100 motors a day.

Editor, MOTOR WORLD: The announcement in newspapers that the Stewart-Warner Speedometer Corp. has been awarded the equipment contract on Ford cars is not based on fact. No such order has been placed although negotiations for partial equipment are under way but nothing definite has been done. —Stewart-Warner Speedometer Corp.

PROMINENT MEN OF TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve
to Place Many Workers in New
Places—Few of Them Leave
the Industry

Harry Bland has resigned as president and secretary of the Blue Ribbon Garage, Springfield, Mass.

W. L. Chilman has been appointed manager of the Detroit branch of the Regal Motor Car Co., at 758 Woodward avenue.

O. E. Pore is sales manager of the Roberts-Toledo Auto Co., Ford dealer in Toledo, O. Pore succeeds H. W. Lancashire.

Walter C. Allen has been elected president of the Yale & Towne Co., succeeding H. R. Towne, who was made chairman of the board.

Chas. T. Naddy, formerly with the Great Lakes Refining Co., Cleveland, has been appointed traveling representative for the Everitt Auto Sales Co., Columbus.

W. F. Townsend has been appointed sales manager of the E. C. Johnson Motor Co., Broad and Spring Garden streets, Eastern distributors of the Reo, in Philadelphia, Pa.

G. W. Gaidzik has joined the Thomas B. Jeffery Co., Kenosha, Wis., as a special foreign representative. He will represent the Jeffery Quad in Chile, having left for Iquique.

William J. Slater, who was assistant sales manager and in charge of the advertising of the Durant-Dort Carriage Co., Flint, recently resigned to join the sales organization of the Firestone Tire & Rubber Co., Akron.

H. G. Berau, formerly Eastern supervising manager of the old Maxwell-Briscoe Motor Co., has been appointed manager of the retail department of the Briscoe Motor Distributing Co., 2033 Market street, Philadelphia, Pa.

C. J. Brokaw has been made district manager in Omaha for the Maxwell Motor Sales Co. He has jurisdiction over the territory immediately adjacent to Omaha. Formerly he was located in Fargo, N. D., and succeeds G. H. Williamson.

C. B. Reeser has resigned as manager of the Chicago branch of the Kellogg Mfg. Co., Rochester, N. Y., to join the Willard Storage Battery Co., Cleveland. He is succeeded by Earl Morris, who has been with the Kellogg company for several years. The branch is at 1112 South Michigan avenue.

Newton A. Fuessle has been appointed advertising manager of the Chalmers Motor Co., taking the place of Lee An-

derperson, who is now in a like capacity with the Hupp Motor Car Co. Fuessle comes from the advertising department of the Packard Motor Car Co., where he was during the last six months.

A. J. Rogers has been appointed head of the sales-service department of the Nordyke & Marmon Co., Indianapolis, and will give sales and advertising co-operation to Marmon dealers. Formerly he was manager of the Remy Electric company's New York office and later was with the Jones Electric Starter Co., Chicago.

J. G. Perrin, formerly chief engineer of the old Lozier Motor Co., is now identified with the engineering department of the Continental Motor Mfg. Co. He first became associated with the Lozier interests when Lozier made bicycles. Later, he designed the first Lozier motor cars and remained as chief engineer until the company became insolvent.

A. H. Doolittle has sold the A. H. Doolittle Advertising Service to the Louis A. Pratt Advertising Co., 401 Ford building, Detroit, Mich., and is now sales and advertising manager of the Zenith Carbureter Co., whose advertising campaign he has handled for some time. Doolittle was formerly advertising manager of the Knox Motor Car Co., and of the Continental Motor Mfg. Co.

New Castle Rubber Expands

The New Castle Rubber Co., Sharon, Pa., has purchased the building and property of the New Castle Iron & Steel Co., which it will remodel for the manufacture of tires and other rubber goods. The price paid for the property was \$98,000. The new company is capitalized at \$250,000 and will be in operation by May 1.

Walpole Assets Bring \$780,000

The assets of the Walpole Tire & Rubber Co., Walpole, Mass., were sold to Chas. T. Wilson and others representing a creditors' committee for \$780,000, this being the highest bid received. It has been ordered that all parties concerned appear on March 22 before the District Court of the U. S., District of Massachusetts, to show cause why the receivers should not be authorized to accept the bid.

Chicago Association Reelects Allison

H. M. Allison was reelected president of the Chicago Automobile Trade Association at the annual meeting held March 8. The other officers elected were: Vice-president, C. W. Stiger, Stromberg Motor Devices Co; secretary, D. E. Whipple, Anderson Electric Car Co.; treasurer, Henry Paulman, Pierce-Arrow Motor Car Co. The following directors were elected: Frank H. Pietsch, White Co., one year; Walter C. Githens, Maxwell Motor Co., and J. L. McLaren, Hudson Motor Car Co., two years.

DEALERS PROTEST AGAINST SCORE OF PENDING BILLS

Hewitt Measure, Chief Bone of Contention, Styled Unconstitutional and Confiscatory—Other Measures Deeply Scored

Characterizing the present motor vehicle law as unconstitutional, Charles Thaddeus Terry, together with delegates from New York and Brooklyn dealers' associations and from all of the larger state motorists' bodies, appeared before the Joint Committee on Internal Affairs at Albany on Wednesday last and entered formal protest against the score or more of bills which are at present pending in the legislature.

The measure upon which fire was centered was the Hewitt bill, which, in addition to doubling the fees for the registration of pleasure cars, also places a heavy burden on the users of commercial vehicles. In assailing the Hewitt bill, Terry pointed out that there is nothing in the present law which provides for the collection of fees greater than those actually necessary to offset the expense of the registration.

In New York State, he said, this amounts to about \$2. Hence, he added, the levying of higher fees constitutes a violation of the law which reaches the proportions of confiscation. Immediately the amount is increased beyond the necessary \$2, he stated, the fee becomes a tax and as such it is unconstitutional for the simple reason that it is discriminatory and applies only to the users of motor vehicles whereas the users of horse-drawn vehicles are exempt. "It is," he added, "class legislation and therefore contrary to all principles of taxation."

The attitude of dealers and users in New York State, he summed it up, is that if \$1 more of impost is added, presumably for the maintenance of highways, users and dealers will rise up and actions will be started which will result in the present law being declared unconstitutional by the courts, as has already been done in several other states, such as Michigan, Florida, Ohio and some others.

Melvin T. Bender, representing the New York State Motor Federation, reiterated what Terry said and added that with all law left out of the question, the Hewitt measure is unfair in that it does not classify all vehicles and tax in proportion to the amount of damage they do to the roads. Such a measure, he added, would have the support of both users and dealers.

With regard to the other bills, Terry pointed out the fallacy of expecting an examination, such as would be required by one of them, to result in a lessening of accidents. He pointed out that such examinations as are made are little more than farces in any case, and added that allowing for 180,000 cars in use, and perhaps four members of each family driving, the necessary examination would require something like 4,000,000 hours, allowing three hours each for the written and driving tests. The result, he added, would be obtained in about 1917 or 1918. As for the bill which would require every motorist to supply a bond of \$5,000, he could see no benefit in this measure except to the surety companies.

John N. McInerney, counsel for the New York State Motor Federation, stated that it was his belief that the Hewitt measure was introduced largely because of a panicky feeling brought about by untimely statements that the State of New York is bankrupt. It was easy, he said, to make it appear so. Many of the bills which are introduced, he added, are merely for local consumption and to let the constituents of the

legislators know that they are at least busy at something.

Another measure which was protested was Senate bill No. 1041, which would prohibit the use of non-skid devices of any type, whether chains or merely the usual corrugated rubber. Although it was pointed out that it was not the intent of the measure that it apply to pleasure vehicles, the bill distinctly includes these. It is understood that the verbiage will be altered to make this provision apply only to heavy traction engines.

Those present at the hearing included: R. H. Johnson, president Automobile Dealers' Association, Inc.; John M. Ross, New York State Motor Federation; Charles Thaddeus Terry, Counsel Automobile Dealers Association, Inc.; C. M. Tobin, secretary Automobile Club of Rochester; Clinton Noble, attorney, Automobile Club of Utica; Dai H. Lewis, secretary Automobile Club of Buffalo; C. W. Brown, manager Winton Motor Car Co. of New York; John N. McInerney, counsel New York State Motor Federation; Mr. Evans and Mr. Spitzer, Brooklyn Garage Owners Board of Trade; Mr. Schmidt, president Rochester Automobile Club; Hon. Francis M. Hugo, secretary of state; Ralph H. Gorsline, director Rochester Automobile Club; S. P. McMinn, Motor World.

Barber Patent Suit Settled

The patent suit which William Barber, a Brooklyn, N. Y., inventor, brought against G. B. Foster, Yonkers, N. Y., Buick dealer, for alleged infringement of patent No. 781,802, issued February 7, 1905, has been settled and the right to use the patent granted the Buick Motor Co. It is understood that several other companies as well have obtained the right to use the construction.

The particular point covered by Barber's patent is the removability of cage valve construction, the claims stating: "In an explosion motor the combination with an explosion chamber having an inlet orifice provided at one side with means for connecting same with an explosive vapor supply pipe a normally closed inlet valve located in such inlet orifice and a removable plug secured in the bushing so as to close the outer end thereof and secure the valve in position in such a manner that the valve may be removed without disturbance of the bushing upon removal of the plug."

Lexington (Ky.) Dealers to Organize

A meeting has been called for March 19, in Lexington, Ky., for the formation of an association of motor car and accessory dealers in what is known as the Blue Grass district, including the counties of Franklin, Anderson, Mercer, Boyle, Garrard, Madison, Clark, Bourbon, Lincoln, Montgomery, Nicholas, Scott, Woodford, Jessamine, Fayette, Harrison and Fleming. It is expected that in these counties there are about 65 dealers who will become affiliated with the organization. S. B. Featherstone is chairman of a committee which has the project in hand and associated with him are A. B. Rumley, of Midway; R. M. Hunter, of Nicholasville; E. T. Pritchard, of Paris, and C. W. Howard and Thomas B. Dewhurst, of Lexington.

The Auto Surplus Stock Syndicate, New York city, a supply dealer, has removed from its old location, 875 7th avenue, to new quarters at 1675 Broadway.

CONDENSING SYSTEM IN NEW STANLEY STEAMER

**Water Economy Increases Mileage and
Permits Smaller Tank—Many
Detail Improvements
Incorporated**

While the fundamental principles of the Stanley steam car, manufactured by the Stanley Motor Carriage Co., Newton, Mass., remain as they have been for years, many detail changes have been made. The most recent changes are perhaps the most important and they affect not only the appearance but also the operation of the car. The price is \$1,975 and the car is electrically lighted, the Splitdorf-Apple system being installed.

The new car is of modern design from the V-shaped radiator—which is a condenser—to the gracefully curved rear end. The wheelbase has been increased 10 inches and is now 130 inches. There is nothing in the exterior lines to distinguish the Stanley from a gasoline car.

Two extremely important improvements have been incorporated in the new model. One consists in the drilling of the burner plate instead of slotting it as formerly; this results in an increase of about 30 per cent in the boiler output and precluded the necessity for installing a larger steam generator. The tubes, incidentally, have been brazed on the inside so that burning out is practically impossible.

The greatest advance, however, is in the use of the condenser, which so economizes the use of water that a run of 200 miles can be made on a single tank—24 gallons. Formerly the tank held 40 gallons. Trouble from clogging the condenser with oil has been overcome by lubricating the cylinders with deflocculated graphite and just sufficient oil to prevent rusting of the iron surfaces. A gallon of oil is sufficient for about 500 miles and kerosene is used for fuel at the rate of a gallon for 12 miles.

Many minor improvements are found in the new model. An automatic feed-water control has been added to the hand control, so that the boiler will take care of its own feed, though the driver may control it if he so desires. The control has been shifted to the left; the steering gear is a new Warner; the brakes have been increased to 14 x 2 on the drums; and the fuel and water pumps are driven from the rear axle instead of from the engine. The lighting generator is geared direct to the differential, making a very neat and simple installation; the battery is a Willard.

Despite the increased size of the car the weight has been kept down by making the body entirely of aluminum; also the water tank has been reduced from

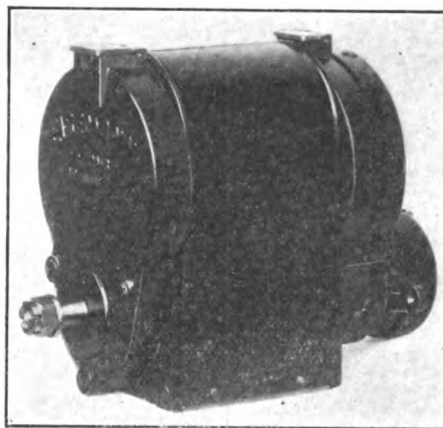
40 gallons to 24 and detail refinements in other directions have cut off weight.

While the engine is rated at 20 horsepower, its actual output is dependent upon the pressure of the steam supplied to it, and as a matter of fact may be greatly in excess of 20 horsepower. The engine is bolted to the rear axle housing, with which it forms a rigid unit. The suspension of the car is most unusual, in that it retains the perch system; the body rests on a built-up platform formed by the two axles and the perch rods through which the drive is taken.

The frame is of channel steel, the front springs semi-elliptics and the rear springs elliptics; both front and rear axles are Timkens. The finish is in dark blue with fine gray striping and black running gear.

LATEST EISEMANN MODEL SIX-CYLINDER MAGNETO

In addition to the Type G four-cylinder magneto announced in September by the Eisemann Magneto Co., Bush Terminal, New York City, a six-cylinder in-



New Eisemann magneto with oxidized laminations and simplified setting system

strument has just been brought out. In general appearance the new magneto is similar to the four-cylinder design except that the large driving gear wheel is at the rear end instead of at the forward end, thus giving a slightly different appearance to the exterior.

The magnets are covered by a sheet steel housing which is pressed into place, making a tongue and groove joint which is water tight. The distinctive tapered pole piece has been retained, but efficiency of the armature winding has been considerably increased. A new feature is the use of oxidized laminations for the core. This prevents eddy currents due to the insulating film of oxide.

One of the great features of the new instrument is that installation and timing has been simplified. On the distributor gear there are two marks, L. and R, for left and right hand rotation. It is merely necessary to place number 1 piston in firing position and align the R or L with a screw in the distributor housing.

NEW HERFF-BROOKS FOUR TOURING CAR COSTS \$765

**Has Compact and Simple Perkins Unit
Power Plant, Disco Electric Light-
ing-starting and Full
Equipment**

A light four-cylinder car, designated as Model 25, is the most recent product of the Herff-Brooks Corp., Indianapolis, Ind., and sells for \$765 with all equipment, including Disco electric starting-lighting system. But one type of body is mounted, a five-passenger touring, having modern conventional lines. The wheelbase is 106 inches, the tread standard and the tires Goodyear 30 x 3½ on demountable rims.

In addition to the starting-lighting system, the equipment includes one-man top, two-piece rain-vision ventilating windshield, Stewart speedometer, an extra demountable rim, electric horn and tools.

The motor is a Perkins with L-head block-cast cylinders 3¼ x 4½, which makes the S. A. E. rating 16.9. Valves are on the left side and are covered by plates held in place by easily removed screws. The Holley carburetor is on the same side as the cover plates, but, because of its high location, does not interfere with their removal. Atwater Kent ignition is fitted. Cooling is by thermo-syphon system with a tubular radiator.

Extreme simplicity is conspicuous in the motor connections; the carburetor, which is fed by the Stewart vacuum system, is bolted direct to the manifold flange without a header; the casting containing the intake and exhaust manifolds bolts direct to the cylinder casting, and the fan bracket is held in place by extensions of two of the timing gear housing bolts.

Unit power plant design is used; the gearset, providing three speeds, is coupled to the motor by a cone clutch. Gears are of nickel steel and the main gear shafts run on New Departure ball bearings.

The propeller shaft is fitted with two universals and drives to a floating Salisbury rear axle having both roller and ball bearings. The wheels are of wood. External and internal brakes act on rear wheel drums. Rear springs are cantilever and the front springs semi-elliptic. The body is finished in black and the wheels in natural wood.

Lewin Takes London Dodge Agency

Guy Lewin, head of Guy Lewin, Ltd., London, has received the Dodge Bros. agency for London. Lewin will make permanent quarters in Detroit, Mich., where he will carry on all business in the interests of the London concern.

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT												
K	4-4½x5½	27.2	Spldf	Zenith	A-Lite	Disk	3	116	34x4	1,735	.....	.....
L	4-4½x5½	32.4	Spldf	Zenith	A-Lite	Disk	3	121	36x4½	2,085	.....	.....
F	6-3½x5½	33.75	Bosch	Zenith	A-Lite	Disk	4	130	35x4½	2,190	2,190	2,290
H	8-3 x5	28.8	Battery	Zenith	Remy	Disk	4	121	34x4	2,085	.....	.....
ALLEN												
34	4-3½x5	21.0	Wths	Stmbg	Wths	Cone	3	110	32x3½	895	895	.....
ALTER												
4-27	4-3½x4½	22.5	Remy	Holley	Remy	Disk	3	106	30x3½	685	685	.....
APPERSON												
4-40	4-4 x5	25.6	Elsmn	Rafid	Bljur	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	32.4	Elsmn	Rafid	Bljur	Band	3	130	36x4	1,685	1,685	.....
6-60	6-4½x5	43.5	Mea	Rafid	Bljur	Band	3	130	36x4	2,200	2,250	2,350
3-45	6-3½x5½	29.45	Elsmn	Rafid	Bljur	Band	3	122	34x4	1,435	.....	.....
ARBENZ												
1915	4-4½x5½	27.2	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,885	.....
ARCO												
Argo	4-2 5-16x4	8.5	A. Kent	Argo	.....	Cone	2	90	28x2½	295	.....	.....
ATURN												
4-36	4-3½x5	22.5	.....	Rafid	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	29.45	.....	Rafid	.....	Cone	3	126	34x4	1,530	.....	.....
6-47	6-3½x5½	33.75	Bosch	Rafid	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN												
66	6-4½x6	48.6	Wths	Master	Wths	Disk	6	141	31x4½	3,600	3,600	3,600
BAUER												
R	4-4½x5	38.1	Mea	Shblr	Emran	Disk	3	110	34x3½	875	1,000	.....
BRISCOE												
B	4-3½x5½	15.6	Spldf	.....	Apico	Cone	3	107	30x3½	785	785	.....
BUICK												
C-24-5	4-3½x3½	22.5	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	22.5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	33.7	Delco	Marvel	Delco	Cone	3	130	36x4½	1,650	.....	1,650
CADILLAC												
51	8-3½x5½	31.2	Delco	Own	Delco	Disk	3	122	36x4½	1,975	1,975	1,975
CARTER												
9	4-3½x5	19.6	Delco	Shblr	Delco	Frn Trs	106	33x4	.....	1,250	.....	.....
CASE												
35	4-4½x5½	29.0	Bosch	Rafid	Wths	Disk	3	120	35x4½	1,600	.....	.....
40	4-4½x5½	32.4	Bosch	Rafid	Wths	Disk	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	22.5	Wths	Stmbg	Wths	Disk	3	115½	34x4	1,250	.....	.....
CHADWICK												
19	6-5 x6	60.0	Bosch	Own	Wths	Band	4	119	37x5r	5,500	5,500	5,500
CHALMERS												
26-B	6-3½x5½	29.4	A. Kent	Rafid	Entz	Disk	3	125½	34x4½	1,650	1,725	.....
M-6	6-4 x5½	38.4	Bosch	Rafid	Entz	Disk	4	132	36x4½	2,400	2,400	.....
32	6-3½x5	23.5	A. Kent	Rafid	G & D	Disk	3	120	34x4	1,400	.....	.....
CHANDLER												
15	6-3½x5	27.3	Bosch	Rafid	G & D	Disk	3	120	34x4	1,295	.....	.....
CHEVROLET												
H-4	4-3 11-16x4	14.4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	875	.....	.....
H-2	4-3 11-16x4	14.4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE												
4-40	4-4½x5½	29.0	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	128	35x4½	1,865	1,865	1,865
6-51	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	128	35x4½	1,685	1,685	1,685
6-60	6-4½x5½	48.6	Delco	Stmbg	Delco	Cone	3	134	37x5	2,465	2,465	2,465
8	8-3½x4½	39.2	Delco	Stmbg	Delco	Cone	3	126	34x4½	1,785	.....	1,785
CRAWFORD												
6-35	6-3½x5	29.4	Wths	Stmbg	Wths	Disk	3	120	34x4	1,850	1,850	.....
CROW												
E-42	4-4 x5	25.6	G & D	Shblr	Emran	Disk	3	114	33x4	1,150	1,165	.....
E-53	4-4½x5½	32.4	G & D	Shblr	Emran	Disk	3	130	34x4	1,475	1,600	.....
E-62	6-3½x5½	33.7	G & D	Shblr	Emran	Disk	3	130	36x4	1,895	1,895	.....
C. E. Jr	4-3½x4½	15.6	Disco	Holley	Disco	Disk	3	104	30x3½	725	.....	.....
CUNNINGHAM												
8	4-4½x5½	38.1	Bosch	Stmbg	Undec	Disk	3	129	37x5	.....	3,750	.....
CYCLEPLANE												
Tour	4-2½x4	10.0	A. Kent	Own	.....	Disk	3	108	28x3	350	.....	.....
Trav	2-3½x4	9.1	A. Kent	Shblr	.....	.....	2	96	28x2½	350	.....	.....
DAVIS												
38-A	4-3½x5	22.5	Wths	Stmbg	Wths	Cone	3	113	34x4	1,235	1,235	.....
6-D	6-3½x5½	33.7	Bosch	Stmbg	G & D	Disk	4	128	37x4½	2,185	.....	.....
DETROITER												
C	4-3½x5	19.6	Remy	Stmbg	Remy	Disk	3	112	32x3½	985	.....	.....
8	8-3½x4½	24.2	.....	.....	.....	.....	.....	.....	.....	1,295	.....	.....
DILE												
A	4-2½x4	11.2	Brng	Holley	.....	Disk	3	96	28x3	485	.....	.....
DODGE												
...	4-3½x4½	24.2	Elsmn	Own	N E	Cone	3	110	32x3½	785	.....	.....

ABBREVIATIONS—"G & D" Gray & Davis, "Spldf" Spltdorf, "A-Lite" Auto-lite, "Wths" Westinghouse, "Shblr" Schbler, "Elsmn" Elsmann, "Rafid" Rayfield, "A. Kent" Atwater Kent, "Emran" Emerson, "Sevan" Severson, "Undec" Undecided, "Brng" Berling, "Kngstn" Kingston, "Natnl" National, "W. Lard" Ward Leonard, "U. S. L." United States Lighting, "Conn" Connecticut, "Stwt" Stewart, "Nwcmb" Newcomb, "N. E." North East.

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
DORRIS												
1A-4	4-4½x5	30.6	Wths	Stmbg	Wths	Disk	3	121	36x4½	....	2,200	2,200
DORT												
Four	4-3 x4	14.4	Conn	.....	Apico	Cone	3	...	30x3	485	....	....
Flre	4-3½x5	16.9	Conn	.....	Apico	Cone	3	...	30x3½	....	680	....
DRIGGS-SEABURY												
C	4-2½x4	10.0	Mgnto	Zephyr	.....	Cone	2	100	28x3	395	....	....
A	4-2½x4	10.0	Mgnto	Zephyr	.....	Frn Trs	100	28x2½	395	....	....	....
EMPIRE												
31-40	4-3½x4½	22.5	Remy	Holley	Remy	Disk	3	108	32x3½	975	975	....
ENGER												
6-50	6-3½x5	29.4	A. Kent	Rafid	G & D	Disk	3	125	34x4	1,495	....	1,495
FIAT												
55	4-130x170	42.2	Bosch	Own	Wths	Disk	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	44.0	Bosch	Own	Wths	Disk	4	135	37x5r	5,150	5,150	5,150
54	4-110x150	29.5	Bosch	Own	Wths	Disk	4	124	36x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS												
82-E	4-4½x5½	27.2	Spldf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	....
90-E	6-4½x5½	40.8	Conn	Rafid	G & D	Disk	3	132	38x4	....	2,500	2,650
FORD												
T	4-3½x4	22.5	Ford	Holley	.....	Disk	2	100	30x3	440	490	....
FRANKLIN												
6-30	6-3½x4	31.5	Elsmn	Own	Dyneto	Disk	3	129	34x4½	2,150	2,150	....
F. R. P.												
45-B	4-4 3-5x6½	33.8	Bosch	Sturt	Bosch	Cone	4	110	30x4	All bodies to order		
GLIDE												
30	4-3½x5	19.6	Wths	Shblr	Wths	Disk	3	114	32x4	1,195	1,195	....
GRANT												
M	4-2½x4	13.3	Swiss	Mayer	A-C	Cone	2	90	28x3	425	....	....
T	6-2½x4½	20.0	A. Kent	Mayer	A-C	Cone	3	106	30x3½	....	796	....
GREAT WESTERN												
A	4-4½x5½	29.0	Kngstn	Kngstn	G & D	Cone	3	117	36x4	1,710	1,710	....
B	4-3½x5½	22.5	Kngstn	Kngstn	Bosch	Cone	3	117	34x4	2,300	....	....
HALLADAY												
6-40	6-	....	Wths	Stmbg	Wths	Disk	3	...	34x4	....	1,385	....
HAYNES												
30	6-3½x5	29.4	Remy	Rafid	L-N	Disk	3	121	34x4	1,485	1,485	....
31	6-4½x5½	43.5	Stimms	Stmbg	L-N	Band	3	130	36x4½	....	2,250	....
33	6-3½x5	29.4	Remy	Rafid	L-N	Disk	3	127	35x4½	....	....	1,550
32	4-4½x5½	29.0	Stimms	Stmbg	L-N	Band	3	118	34x4	....	1,060	....
HERFF-BROOKS												
4-40	4-4½x5	32.4	Bosch	Stmbg	Apico	Cone	3	118	34x4	1,100	1,100	....
6-50	6-4 x4½	38.4	Bosch	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	....
HERRESHOFF												
4-16	4-2½x3½	8.9	A. Kent	Carter	Dyneto	Cone	3	94	28x3	500	....	....
HOLLIER												
...	8-3 x4½	28.8	.....	.....	.....	Cone	3	112	32x3½	....	985	....
HUDSON												
6-40	6-3½x5	29.4	Delco	Zenith	Delco	Disk	3	123½	34x4	1,550	....	1,550
6-54	6-4½x5½	40.8	Delco	Zenith	Delco	Disk	4	135	36x4½	....	....	2,353
HUPMOBILE												
H	4-3½x5½	16.9	Bosch	Zenith	Wths	Disk	3	105	33x4	1,050	1 0 0	....
K	4-3½x5½	18.2	A. Kent	Zenith	Wths	Disk	3	119	34x4	1,200	1,200	1,225
IMPERIAL												
64	4-3½x5	22.5	A. Kent	Stmbg	G & D	Disk	3	115	32x3½	....	1,085	....
56	6-3½x5½	33.7	Spldf	Stmbg	N E	Disk	3	130	38x4½	....	....	2,220
66	6-3 x5	21.6	.....	.....	.....	Disk	3	...	33x4	....	1,285	....
INTER-STATE												
T	4-3½x5	19.6	Remy	Shblr	Remy	Cone	3	110	33x4	....	1 000	....
JACKSON												
46	4-4½x5½	32.4	Remy	Shblr	A-Lite	Cone	3	117	34x4	1,375	1,375	....
48-6	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	125	34x4½	....	1,650	....
JEFFERY												
Four	4-4½x5½	22.5	Bosch	Rafid	U S L	Cone	4	116	34x4	1,500	1,500	....
Six	6-3½x5½	33.7	Bosch	Rafid	U S L	Disk	4	133½	34x4½	....	....	2,400
Chfd	6-3 x5	21.6	Bosch	Stmbg	Bljr	Disk	4	122	34x4	1,650	1,650	....
KEARNS												
L	4-2½x4	13.3	Brng	Zenith	A-C	Cone	4	109	28x3	450	....	....
KING												
...	4-3 15-16x5	24.7	A. Kent	Stmbg	W. Lard	Disk	3	113	33x4	1,075	1,075	....
...	8-2½x5	24.1	A. Kent	Zenith	W. Lard	Disk	3	113	33x4	....	1,350	....
KINSEL												
4-36	4-4½x5½	29.0	Wths	Stmbg	Own	Cone	3	121	34x4	1,450	1,450	1,550
6-42	6-3½x5½	31.5	Wths	Stmbg	Kinsel	Cone	3	129	34x4	1,650	1,650	1,850
6-48	6-4 x5½	38.4	Mea	Rafid	Kinsel	Cone	4	132½	36x4½	2,350	2,350	2,390
6-60	6-4½x5½	48.6	Bosch	Rafid	Kinsel	Cone	4	142	37x5	3,150	3,150	3,170
KLINE												
6-42	6-3½x5½	29.4	Wths	Rafid	Wths	Disk	3	123	34x4	1,750	1,750	....
6-42-A	6-4½x5½	29.4	Wths	Rafid	Wths	Disk	3	127	35x4½	....	....	1,820

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT												
O	4-3 $\frac{1}{2}$ x4	22.5	Disco	Johnson	Disco	Disk	3 108	32x3 $\frac{1}{2}$	850	870	.....	.....
M	4-3 $\frac{1}{2}$ x4	22.5	Bosch	Stmbg	N E	Disk	3 108	32x3 $\frac{1}{2}$	995	995	.....	.....
LAMBERT												
48-C	4-3 $\frac{1}{2}$ x4	22.5	Briggs	Shblr	Briggs	Fm Trs	112	32x3 $\frac{1}{2}$	.....	1,200	.....	.....
68-C	4-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	27.2	Briggs	Shblr	Briggs	Fm Trs	117	34x3 $\frac{1}{2}$	1,565	1,565	.....	.....
LENOX												
Four	4-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	29.0	Wths	Own	Wths	Cone	3 118	34x4 $\frac{1}{2}$	.....	2,000	.....	.....
Six	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	33.7	Wths	Own	Wths	Cone	3 130	34x4 $\frac{1}{2}$	.....	2,465	.....	.....
LEWIS												
VI	6-3 $\frac{1}{2}$ x6	29.4	Briggs	Stmbg	Remy	Disk	3 135	36x4	1,600	1,600	.....	.....
LEXINGTON												
Four	4-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	24.2	Wths	Shblr	Wths	Disk	3 115	34x4	1,375	1,375	.....	.....
6-L	6-3 $\frac{1}{2}$ x5	29.4	Wths	Shblr	Wths	Disk	3 128	34x4	1,875	1,875	.....	.....
6-M	6-4 $\frac{1}{2}$ x5	40.8	A. Kent	Stmbg	Jesco	Cone	3 130	36x4 $\frac{1}{2}$	2,575	2,575	2,675	.....
LOCOMOBILE												
M-5	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	48.6	Bosch	Own	Wths	Disk	4 140	37x5	5,100	.....	5,100	.....
R-5	6-4 $\frac{1}{2}$ x5	43.5	Bosch	Own	Wths	Disk	4 132	37x5 $\frac{1}{2}$	4,400	4,400	.....	.....
LUVERNE												
760	6-4 x5	38.4	Bosch	Shblr	Jesco	Disk	3 128	36x4 $\frac{1}{2}$	.....	2,500	.....	.....
LYONS-KNIGHT												
K-4	4-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	32.4	Simms	Stmbg	N E	Disk	3 130	37x5	.....	2,900	2,980	.....
MARION												
...	3-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	31.2	Bosch	.....	G & D	Disk	3 115	34x4	1,500	1,500	.....	.....
...	6-3 x5	21.6	Bosch	.....	G & D	Disk	3 122	34x4	.....	1,350	.....	.....
...	4-3 $\frac{1}{2}$ x5	22.5	Bosch	Rafld	G & D	Disk	3 115	34x4	.....	1,250	.....	.....
MARMON												
41	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	43.5	Bosch	Stmbg	Bosch	Cone	3 132 $\frac{1}{2}$	36x4 $\frac{1}{2}$	3,250	3,250	3,350	.....
48	6-4 $\frac{1}{2}$ x6	48.6	Bosch	Zenith	Roth	Disk	3 145	37x5 $\frac{1}{2}$	.....	5,000	.....	.....
MAXWELL												
25	4-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	21.0	Simms	Kingstn	Simms	Cone	3 103	30x3 $\frac{1}{2}$	725	750	.....	.....
McFARLAN												
T	6-4 x6	38.4	Wths	Stmbg	Wths	Cone	3 132	36x4 $\frac{1}{2}$	2,300	2,590	2,590	.....
X	6-4 $\frac{1}{2}$ x6	48.6	Wths	Stmbg	Wths	Cone	3 132	36x4 $\frac{1}{2}$	2,900	2,900	2,900	.....
McINTYRE												
35	4-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	19.6	Bosch	Stmbg	G & D	Cone	3 106	32x3 $\frac{1}{2}$	.....	850	.....	.....
6-40	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	29.4	Briggs	Stmbg	Briggs	Disk	3 120	37x4	.....	1,275	.....	.....
MERCER												
Spdstr	4-3 $\frac{1}{2}$ x6 $\frac{1}{2}$	22.5	Bosch	Zenith	U S L	Disk	4 120	34x4 $\frac{1}{2}$	2,750	.....	.....	.....
...	4-3 $\frac{1}{2}$ x6 $\frac{1}{2}$	22.5	Bosch	Zenith	U S L	Disk	4 130	34x4 $\frac{1}{2}$	.....	3,000	.....	.....
METEOR												
42	4-4 x5	25.6	A. Kent	Stmbg	Spdfr	Disk	3 114	34x4	.....	1,075	.....	.....
45	6-3 $\frac{1}{2}$ x5	33.7	A. Kent	Stmbg	Spdfr	Disk	3 126	35x4	.....	1,395	.....	.....
NIETZ												
22	4-3 $\frac{1}{2}$ x4	22.5	Bosch	Own	G & D	Fm Trs	98	30x3	495	.....	.....	.....
25	4-3 $\frac{1}{2}$ x4	24.2	.....	A W T	G & D	Fm Trs	105	32x3 $\frac{1}{2}$	.....	600	.....	.....
MITCHELL												
Four	4-4 x5 $\frac{1}{2}$	25.6	Conn	Rafld	Spdfr	Cone	3 116	34x4	1,250	1,250	.....	.....
Six	6-4 x5 $\frac{1}{2}$	38.4	Conn	Rafld	Spdfr	Cone	3 128	36x4	1,585	1,585	.....	.....
7-6	6-4 $\frac{1}{2}$ x7	43.5	Remy	Rafld	Remy	Cone	3 144	37x5	.....	2,350	.....	.....
5-6	6-4 $\frac{1}{2}$ x6	43.5	Remy	Rafld	Remy	Cone	3 132	36x4 $\frac{1}{2}$	1,895	1,895	.....	.....
MOLINE-KNIGHT												
...	4-4 x6	25.6	Bosch	Shblr	Wagner	Cone	4 128	36x4 $\frac{1}{2}$	2,500	2,500	2,500	.....
40	4-3 $\frac{1}{2}$ x5	19.6	Conn	.....	.....	Cone	3 118	34x4	.....	1,475	.....	.....
MONARCH												
Six	6-3 $\frac{1}{2}$ x5	29.4	A. Kent	Zenith	W. Lard	Cone	3 125	33x4	.....	1,250	1,275	.....
MONROE												
M-2	4-3 x3 $\frac{1}{2}$	14.4	Conn	Zenith	A-Lite	Cone	3 96	30x3	460	.....	.....	.....
MOON												
4-38	4-3 $\frac{1}{2}$ x5	22.5	Delco	Rafld	Delco	Disk	3 122	34x4	1,350	1,350	.....	.....
6-40	6-3 $\frac{1}{2}$ x5	29.4	Delco	Rafld	Delco	Disk	3 122	34x4	1,575	.....	.....	.....
6-50	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	33.7	Delco	Rafld	Delco	Disk	4 130	35x4 $\frac{1}{2}$	2,150	.....	.....	.....
MORSE												
D	4-4 $\frac{1}{2}$ x5	34.2	Eismn	Stmbg	G & D	Disk	4 127	36x4 $\frac{1}{2}$	3,600	3,600	3,600	.....
NATIONAL												
AB	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	32.7	Eismn	Rafld	Wths	Cone	3 134	36x4 $\frac{1}{2}$	2,375	2,375	.....	.....
NORWALK												
F	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	29.4	A. Kent	Rafld	G & D	Disk	4 131	37x4	1,875	.....	.....	.....
OAKLAND												
37	4-3 $\frac{1}{2}$ x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,150	1,200	.....	.....
40	6-3 $\frac{1}{2}$ x5	29.4	Delco	Johnson	Delco	Cone	3 123 $\frac{1}{2}$	35x4 $\frac{1}{2}$	.....	1,685	.....	.....
Spdstr	4-3 $\frac{1}{2}$ x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,100	.....	.....	.....
OGREN												
Six	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	33.7	Bosch	Rafld	B-Bahm	.....	3	.....	.....	2,700	.....	.....
OLDSMOBILE												
42	4-3 $\frac{1}{2}$ x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,285	1,285	.....	.....
55	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	43.5	Delco	Marvel	Delco	Cone	3 130	36x5	.....	2,975	.....	.....
OVERLAND												
80	4-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.2	Bosch	Shblr	A-Lite	Cone	3 114	34x4	1,050	1,075	.....	.....
81	4-4 x4 $\frac{1}{2}$	25.6	Spdfr	Shblr	A-Lite	Cone	3 108	33x4	795	850	.....	.....
82	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	29.4	Bosch	Shblr	A-Lite	Cone	3 125	35x4 $\frac{1}{2}$	.....	1,475	.....	.....
OWEN												
...	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	33.7	Owen	Master	O M	O M	3 136	35x5	3,750	.....	3,750	.....
PACKARD												
3-38	6-4 x5 $\frac{1}{2}$	38.4	Bosch	Own	Bljur	Plate	3 140	37x5 $\frac{1}{2}$	3,750	3,750	3,850	.....
5-48	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	48.6	Bosch	Own	Bljur	Plate	3 144	37x5	4,750	4,750	4,850	.....
PAIGE												
Six	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	29.4	Bosch	Rafld	G & D	Disk	3 124	34x4	1,385	.....	1,385	.....
36	4-4 x5	25.6	Bosch	Stwrt	G & D	Disk	3 116	34x4	1,075	1,075	.....	.....
PARTIN-PALMER												
20	4-3 $\frac{1}{2}$ x4	15.6	A. Kent	Mulr	G & D	Disk	3 96	28x3	495	.....	.....	.....
38	4-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	22.5	A. Kent	Stmbg	G & D	Disk	3 115	33x4	1,075	.....	.....	.....
PATERSON												
4-32	4-3 $\frac{1}{2}$ x5	19.6	Delco	Stmbg	Delco	Cone	3 112	33x4	.....	1,095	.....	.....
6-48	6-3 $\frac{1}{2}$ x5	29.4	Delco	Stmbg	Delco	Cone	3 124	34x4	.....	1,495	.....	.....
PATHFINDER												
...	6-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	33.7	Wths	Shblr	Wths	Disk	4 125	34x4 $\frac{1}{2}$	2,222	.....	2,322	.....

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PEERLESS												
54	4-3½x5	22.5	A. Kent	Stmbg	G & D	Disk	3 111	34x4	2,000	2,000	.....	.....
55	6-3½x5	29.4	A. Kent	Stmbg	G & D	Disk	3 121	34x4	2,250	2,250	.....	.....
48-6	6-4½x6	48.6	Bosch	Own	G & D	Band	4 137	37x5	4,900	.....	5,000	.....
PETER PAN												
3-E	4-2½x4½	12.0	Brng	.....	.....	Diak	3 110	28x3½	650	.....	.....	.....
PIERCE-ARROW												
C-3	6-4 x5½	38.4	Bosch	Own	Waths	Cone	4 134	36x4½	4,300	4,300	.....	.....
B-3	6-4½x5½	48.6	Bosch	Own	Waths	Cone	4 142	37x5	4,900	4,900	5,000	.....
A-3	6-5 x7	60.0	Bosch	Own	Waths	Cone	4 147½	38x5½	5,900	5,900	6,000	.....
PILOT												
55	6-3½x5½	29.4	Waths	Shblr	Waths	Cone	3 126	34x4	1,885	1,885	1,985	.....
75	6-4½x6	48.6	Waths	Carter	Waths	Cone	3 132	37x4½	2,885	2,885	2,885	.....
PREMIER												
6-50	6-4 x5½	38.4	Eismn	Rafld	Remy	Disk	3 132	36x4½	1,985	1,985	1,985	.....
PRATT												
6-50	6-3½x5½	33.7	A. Kent	Rafld	G & D	Disk	4 132	37x4½	2,150	2,150	2,250	.....
PULLMAN												
Jr	4-3½x4½	22.5	Spldfr	Stmbg	Spldfr	Disk	3 110	30x3½	740	740	.....	.....
6-48	6-3½x5½	33.7	Simms	Stmbg	Waths	Disk	4 134	36x4½	2,500	2,500	2,550	.....
RAYFIELD												
20	4-2½x4½	12.0	A. Kent	Own	.....	Disk	3 96	28x3	.....	397	.....	.....
R-C-H												
K	4-3½x5	16.9	Bosch	B-D	W. Lndr	Cone	3 110	32x3½	.....	775	.....	.....
REGAL												
D	4-3½x5	22.5	A. Kent	Stwrt	Bosch	Cone	3 112	33x4	1,085	1,085	.....	.....
...	8-2½x4½	26.6	.....	Stwrt	B-Rhm	.....	112	33x4	1,250	1,250	.....	.....
...	4-3½x3½	18.2	.....	.....	Spldfr	.....	3 106	30x3½	650	650	.....	.....
REMINGTON												
...	4-3½x4	15.6	A. Kent	.....	W. Lndr	Cone	3 104	30x3½	695	695	.....	.....
Ghnd	8-3½x4½	31.2	A. Kent	Zenith	G & D	Disk	3 116	35x4½	1,485	.....	.....	.....
REPUBLIC												
E	6-4½x5	43.5	Delco	Rafld	Delco	Cone	4 133	36x4½	.....	2,950	3,000	.....
REO												
M	6-3-9-16x5½	30.4	Remy	Johnson	Remy	Diak	3 122	34x4	.....	1,385	.....	.....
ST	4-4½x4½	27.2	Natnl	Holley	Natnl	Disk	3 112	34x4	1,000	.....	.....	.....
R	4-4½x4½	27.2	Remy	Holley	Remy	Diak	3 115	34x4	.....	1,050	.....	.....
ROSS												
A	8-3 x4½	28.8	.....	.....	Own	Disk	3 115	34x4	.....	1,350	.....	.....
SAXON												
A	4-2½x4	11.2	A. Kent	Mayer	.....	Plate	2 96	28x3	395	.....	.....	.....
B2	6-2½x4½	20.0	A. Kent	.....	G & D	Disk	3 112	32x3½	.....	785	.....	.....
SCRIPPS-BOOTH												
C	4-2½x4	13.3	A. Kent	Zenith	Bljur	Disk	3 110	30x3½	775	.....	.....	.....
SPAULDING												
H	4-4½x5½	29.0	Simms	Rafld	Entz	Cone	3 120	36x4	.....	1,680	.....	.....
S. G. V.												
J	4-3½x4½	24.2	Bosch	Zenith	W. Lndr	Disk	4 118	34x4	3,300	3,300	.....	.....
SIMPLEX												
38	4-4½x6½	38.2	Bosch	Nwemb	Bosch	Disk	4 137	37½x5	All bodies to order	.....	.....	.....
50	4-5½x6½	46.3	Bosch	Nwemb	Bosch	Disk	4 137	37½x5	All bodies to order	.....	.....	.....
SINGER												
Slx	6-4 x5½	38.4	Eismn	C R G	Waths	Disk	4 135	36x4½	2,350	2,350	.....	.....
SPEEDWELL												
I	6-4½x5½	40.8	Waths	Shblr	Waths	Diak	3 135	37x5	.....	.....	2,950	.....
SPHINX												
A-15	4-3½x5	16.9	Spldfr	Mayer	Spldfr	Cone	3 112	30x3½	.....	695	.....	.....
STEARNS												
L-4	4-3½x5½	22.5	Bosch	Shblr	G & D	Cone	3 119	34x4	1,750	1,750	.....	.....
S-K-4	4-4½x5½	29.0	Bosch	Stmbg	G & D	Disk	3 127	36x4½	3,750	3,750	3,900	.....
S-K-6	4-4½x5½	43.5	Bosch	Stmbg	G & D	Disk	4 134	37x5	4,850	4,850	5,000	.....
STUDEBAKER												
4-SD	4-3½x5	19.6	Remy	Shblr	Wagner	Cone	3 108	33x4	985	985	.....	.....
6-E-C	6-3½x5	29.4	Remy	Shblr	Wagner	Cone	3 121	34x4	.....	1,385	1,450	.....
STUTZ												
H.C.S	4-3½x5	22.5	Remy	Stmbg	Remy	Cone	3 108	32x4	1,475	.....	.....	.....
Rr. Cat	4-4½x5½	36.1	Bosch	Stmbg	Remy	Cone	3 120	34x4½	2,000	.....	.....	.....
Slx	6-4 x5	38.4	Eismn	Stmbg	Remy	Cone	3 129	34x4½	2,125	.....	.....	.....
T. Car	4-4½x5½	36.1	Bosch	Stmbg	Remy	Cone	3 130	34x4½	.....	2,275	.....	.....
T. Car	6-4 x5	38.4	Eismn	Stmbg	Remy	Cone	3 130	34x4½	.....	2,400	.....	.....
TOURNAINE												
12	6-4 x5½	38.4	Simms	Zenith	Waths	Diak	4 124	34x4½	3,150	3,150	3,200	.....
TRUMBULL												
15-A	4-7½x4	13.3	Spldfr	Breeze	W. Lndr	Cone	3 80	28x3	395	.....	.....	.....
TWOBLY												
...	4-3½x4	15.6	Spldfr	Zephyr	Undec	Cone	3 100	20x3	660	770	.....	.....
VELIE												
4-45	4-4½x5½	34.2	Bosch	Stmbg	G & D	Diak	4 121	37x4½	1,750	1,750	.....	.....
6-50	6-3½x5½	33.7	Bosch	Stmbg	G & D	Diak	4 136	38x4½	2,015	2,015	.....	.....
Bltwl	6-3½x5	29.4	A. Kent	Stmbg	G & D	Diak	4 124	34x4	1,595	1,595	.....	.....
VIXEN												
S.B	4-2½x4	12.0	A. Kent	Zephyr	.....	.....	106	28x3	395	.....	.....	.....
VULCAN												
...	4-3½x5½	19.6	Waths	.....	Waths	Disk	3 120	32x3½	975	975	.....	.....
WESTCOTT												
O	4-3½x5	19.6	Delco	Shblr	Delco	Cone	3 113	33x4	1,185	1,185	.....	.....
U	6-3½x5	29.4	Delco	Rafld	Delco	Cone	3 125	34x4	.....	1,585	.....	.....
WHITE												
30	4-3½x5½	22.5	Bosch	Own	Own	Plate	4 115	32x4	2,650	2,700	.....	.....
45	4-4½x6½	29.0	Bosch	Own	Own	Plate	4 132½	36x4½	.....	.....	3,800	.....
60	6-4½x5½	43.5	Bosch	Own	Own	Plate	4 140½	37x5	All bodies to order	.....	.....	.....
WILLYS-KNIGHT												
K-19	4-4 x5½	25.6	Simms	Zenith	U S L	Cone	4 120	36x4½	.....	2,475	.....	.....
WINTON												
21	6-4½x5½	48.6	Bosch	Rafld	Alor Elec	Disk	4 136	37x5	3,250	3,250	3,500	.....
21A	6-3½x5½	31.5	Bosch	Rafld	Bljur	Disk	4 128	36x4½	2,285	2,385	.....	.....
WOODS MORILETTE												
3	4-2½x4	10.0	Mgnto	Mayer	.....	Cone	2 104	28x2½	380	.....	.....	.....

Place	Car	Dealer
COMMERCIAL VEHICLES		
INDIANA		
Batesville	Koehler	Meyer Hardware Co.
Shelbyville	Koehler	Carson & Morrison
MASSACHUSETTS		
Boston	Bow	E. F. Bunker
Cheshire	Koehler	S. W. Curtis
OHIO		
Cleveland	Krebs	National Garage Co.
VIRGINIA		
Charlottesville	Koehler	Charlottesville Hardware Co.
PLEASURE CARS		
ARKANSAS		
Bentonville	Mets	H. S. Hess
CALIFORNIA		
Isleton	Oldsmobile	C. K. Cook Netherland Garage
Los Angeles	Moline-Knight	Moline Automobile Co.
COLORADO		
Berthoud	Grant	Berthoud Garage Co.
Coaldale	Chevrolet	Phillip & Perry
Coaldale	Monroe	Phillip & Perry
Denver	Haynes	E. J. Johnson
Denver	Hercules	South Denver Garage Co.
Denver	Dort	J. S. Morrison Auto Co.
Denver	Hupmobile	J. S. Morrison Auto Co.
Denver	Chandler	A. T. Wilson Auto Co.
Fort Collins	Chevrolet	Ben Mosman
Fort Collins	Monroe	Ben Mosman
Greeley	Hupmobile	Schoonmaker & Lee Bros.
Trinidad	Moline-Knight	D. H. Gottlieb
ILLINOIS		
Aurora	Moline-Knight	Sprinkel & Bromley
Bushnell	Moline-Knight	S. H. Robinson
Bushnell	Oldsmobile	D. B. Carithers
Cambridge	Moline-Knight	P. A. Johnson
Chicago	Chevrolet	Chev. Motor Co. of Ill.
Chicago	Moline-Knight	The Austin Garage
Chicago	Moline-Knight	Moline Auto Co.
Dixon	Kissel	B. Nelson
Farmington	Moline-Knight	C. A. Negley
Freeport	Moline-Knight	G. W. Brokhhausen
Freeport	Franklin	D. E. Sunderland
Forreston	Moline-Knight	Abela & Korf
Galesna	Moline-Knight	K. V. Johnson
Hilldale	Moline-Knight	J. P. Butzer & Son
Joliet	Moline-Knight	Long Bros.
La Salle	Dort	J. E. McCabe
London Mills	Moline-Knight	White, Latourette & Sampson
Milledgeville	Dort	E. C. Miller
Morton	Moline-Knight	H. F. Zelle
New Boston	Moline-Knight	D. S. Prentiss
Peoria	Moline-Knight	J. E. Whitten
Ransom	Moline-Knight	Richards & Weber
Rock Island	Moline-Knight	Sauermann Motor Co.
Springfield	Moline-Knight	Seldier & Keener
Wyoming	Moline-Knight	S. Wilkinson
INDIANA		
Elkhart	Chevrolet	W. H. Keeth, Jr.
Evansville	Chevrolet	Fuchs & Angermier
Fort Wayne	Oldsmobile	Shrock Auto Co.
Hartford City	Oldsmobile	A. W. Tindall
Marion	Chevrolet	J. V. Shugart
Seymour	Oldsmobile	H. Chambers
Terre Haute	Oldsmobile	Miller & Stein
Waynetown	Oldsmobile	C. A. Snyder & Son
IOWA		
Avoca	Moline-Knight	Wm. Pratt
Carroll	Enger	Carroll Motor Co.
Carroll	Carter	Carroll Motor Co.
Cedar Rapids	Kissel	Kissel-Kar Co.
Cedar Rapids	Moline-Knight	J. A. Wicke
Cherokee	Moline-Knight	Lamont Bros.
Clinton	Moline-Knight	Model Aut. Co.
Des Moines	Chevrolet	W. A. Oldfield
Durant	Moline-Knight	A. F. Schiele
Dysart	Moline-Knight	Dysart Motor
Fort Dodge	Dort	Hansen & Tyler Auto Co.
Ida Grove	Kissel	J. M. Bees
Kalona	Moline-Knight	Louck & Boehme
Leon	Mets	C. Snyder
Manning	Moline-Knight	Herman Gotch
Mason City	Dort	Snyder & McCall
Modale	Mets	Southside Garage
Sioux City	Grant	J. W. Ohlman
Sioux City	Kissel	Leavitt & Kelley
Tama	Moline-Knight	Grau & McKee
Tama	Dort	Grau-McKee Co.
Tipton	Moline-Knight	Bareley & Smith
Van Horn	Moline-Knight	E. J. Woltersdorf
Villages	Haynes	H. C. Evans
Waterloo	Dort	Burd Auto & S. Co.
Waterloo	Moline-Knight	C. Bixler
KANSAS		
Concordia	Oldsmobile	H. L. Austin
Ford	Oldsmobile	D. C. Cook
Topeka	Begal	Independent Auto Co.
Topeka	Marmon	Independent Auto Co.
Topeka	Chandler	Independent Auto Co.
LOUISIANA		
New Orleans	Oakland	Canal Auto Co.

Place	Car	Dealer
MAINE		
Portland	Scrimps-Booth	Franklin Motor Car Co.
MASSACHUSETTS		
Boston	Pilot	Johnson-Hayes Co.
Boston	Moline-Knight	H. Turner
Great Barrington	Kissel	Connolly & Minard
Haverhill	Moline-Knight	Benton Motor Car Co.
Pittsfield	Ford	F. A. Minkler
Salem	Kissel	W. Williams
Springfield	Reo	Reo Springfield Co.
Waltham	Mets	Mets Automobile Co.
MICHIGAN		
Blissfield	Dort	Hass & Hill
Clare	Chevrolet	J. T. Brown & Son
Davison	Dort	Downer & Fairchild
Erart	Dort	Sanberg & Allison
Fenton	Dort	J. H. Cox
Flint	Chevrolet	C. T. Mines
Flint	Chevrolet	Flint Pattern & Fdry Co.
Lennon	Dort	W. L. Cozadd & Co.
Marcellus	Dort	King & Goodes
Milford	Chevrolet	T. H. Padley
North Star	Dort	F. N. Selby
Portland	Dort	Barton Bros.
Redford	Dort	H. A. & G. A. Miller
Saginaw	Dodge	E. L. Black
Washington	Chevrolet	Wright & Haughton
Williamston	Dort	G. W. Akers
MINNESOTA		
Minneapolis	Chevrolet	Minnesota Motor Car Co.
Minneapolis	Dort	La Crosse Implement Co.
New Ulm	Kissel	E. H. Retzlaff
MISSOURI		
California	Moline-Knight	W. Kuhlmann
Kansas City	Chevrolet	W. S. Hathaway Motor Co.
St. Louis	Argo	Weber Implement & Auto Co.
Springfield	Chevrolet	Yandell Motor Co.

Literature Received

"Always on the Job" is the title of a house organ which has been issued by the Stewart-Warner Speedometer Corp., Chicago. But the company styles it a products organ rather than a house organ. It deals solely with the company's products and is aimed to aid the dealer in increasing his Stewart business. It is 12 pages, 12½ x 9½, in black and green. The first number covers the Stewart vacuum feed test on the Speedway, a Cole performance with the same device, the Mitchell run of 7,518 miles in 30 days with a vacuum feed, descriptions and sectional illustrations of the feed, the Stewart horns

and the Stewart tire pump and a page on speedometers.

Packard Motor Car Co., Detroit. Motor Truck Bulletin No. 1. Folder on the new line of trucks—Four pages, 8½ x 11, on coated India tinted stock; printed in light red and brown. The text tells briefly the story of Packard truck development and sets forth on the inside pages the paramount advantages of the new line. On the fourth page are enumerated "25 good reasons for the new Packard trucks." The illustrations are 12-inch plan of chassis, motor, worm axle in phantom.

Motor Car Securities Quotations

	March 12, 1914	March 13, 1915
	Bid	Asked
Ajax-Grieb Rubber Co., com.	200	250
Ajax-Grieb Rubber Co., pfd.	90	102
Aluminum Castings, pfd.	98	100
Chalmers Motor Co., com.	82	85
Chalmers Motor Co., pfd.	92½	94½
Firestone Tire & Rubber Co., com.	282	283
Firestone Tire & Rubber Co., pfd.	100	109
General Motors Co., com.	77	78
General Motors Co., pfd.	92	95
B. F. Goodrich Co., com.	23½	24½
B. F. Goodrich Co., pfd.	87	90
Goodyear Tire & Rubber Co., com.	155	165
Goodyear Tire & Rubber Co., pfd.	92	93½
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	5	5
International Motor Co., pfd.	15	15
Kelly-Springfield Tire Co., com.	111	112
Kelly-Springfield Tire Co., 1st pfd.	83	85
Kelly-Springfield Tire Co., 2nd pfd.	118	125
Maxwell Motor Co., com.	8	6½
Maxwell Motor Co., 1st pfd.	20	30
Maxwell Motor Co., 2nd pfd.	10½	11½
Miller Rubber Co., com.	90	98
Miller Rubber Co., pfd.	101	103
Packard Motor Car Co., com.	101	116
Packard Motor Car Co., pfd.	95	98
Peerless Motor Car Co., com.	20	20
Peerless Motor Car Co., pfd.	80	85
Portage Rubber Co., com.	35	34
Portage Rubber Co., pfd.	90	85
Reo Motor Truck Co., com.	8	8½
Reo Motor Car Co., com.	18½	19
Stewart-Warner Speed. Corp., com.	56	57
Stewart-Warner Speed. Corp., pfd.	90	101
Studebaker Corp., com.	24½	26
Studebaker Corp., pfd.	80½	82½
Swinehart Tire & Rubber Co.	60½	70½
U. S. Rubber Co., com.	61½	62½
U. S. Rubber Co., pfd.	102½	102½
White Co., pfd.	107	110
Willis-Overland Co., com.	63	68
Willis-Overland Co., pfd.	92	96

*Par value, \$10; all others, \$100.



* Indicates sanctioned by A. A. A.

Mar. 17, Venice, Cal.—California Grand Prix, 300-mile road race.*

Mar. 20, Tucson, Ariz.—Road race, Borderland Automobile Club.

Mar. 23-28, Phoenix, Ariz.—Automobile-Architectural-Industrial Exposition; Armory.

April 20-22, Oklahoma City, Okla.—Road race, S. W. Auto Racing Assn.*

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.*

June 9, Galesburg, Ill.—Galesburg District Fair Association's 200-mile race.

June 19, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Assn.*

June 25, Sioux City, Ia.—Track meet.

July 3, Sioux City, Ia.—Speedway, 300-mile race, Speedway Assn.*

July 4, Tacoma, Wash.—Speedway races, Speedway Assn.*

July 5, Omaha, Neb.—Speedway races, Omaha Motor Speedway.*

July 9, Burlington, Ia.—100-mile track race, Tri-State Fair Assn.

July 31, Denver, Col.—Road race. Promoter, Chas. L. Newcomb, Jr.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 14, Janesville, Wis.—Track meet, Janesville Park Assn.

Aug. 20-21, Elgin, Ill.—Road races, Chicago Auto Club.

Sept. 6, Providence, R. I.—Speedway races. Promoter, I. E. Perkins.

Sept. 8, Kalamazoo, Mich.—100-mile track race, Kalamazoo Motor Speedway.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

THE SHOW CIRCUIT

Mar. 13-20, Harrisburg, Pa.—Automobile show, Rex Garage, Harrisburg Automobile Dealers' Association. J. Clyde Myton, manager.

Mar. 17-20, Bloomington, Ill.—Show; W. H. Tidmarsh, manager.

Mar. 22-27, Bangor, Me.—Automobile show, Auditorium; A. P. Pierce, manager.

Mar. 22-27, Springfield, Mass.—Show; J. H. Graham.

Mar. 24-27, Oil City, Pa.—Show; New Armory.

Mar. 25-27, Mason City, Ia.—Spring Opening Automobile Show; Armory.

Mar. 30-April 2, Johnstown, Pa.—Show; Auditorium.

Apr. 5-10, Du Bois, Pa.—Show; Moose Hall.

Apr. 12-17, Paterson, N. J.—Show; Auditorium; Robert A. Mitchell, director.

MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 12

New York, March 24, 1915

Ten cents a copy
Two dollars a year

PIERCE-ARROW

The mind of the owner of a Pierce-Arrow does not run on ahead of him in vain speculation as to whether the car will be on time, or will get him there on time. He soon sinks into a feeling of trustfulness in regard to his Pierce-Arrow. He need never interrupt his plans, break an engagement, allow greater time for going to and fro, or omit doing anything that counts upon the faithful efficiency of a Pierce-Arrow.

THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO NEW YORK



R. C.

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DANN Insert SPRINGS—
Supplied with DANN
Insert ready installed
—are a new ad-
dition to our
line. Write
for de-
tails.

Inter-leaf shock absorption, endorsed
so strongly by leading automobile authori-
ties, is obtained only by use of

DANN INSERT

"The Inter-leaf Shock Absorber"

DANN Insert is a perfect shock absorber *built into* the spring. It is not an attachment.

DANN Insert is entirely unlike other shock absorbers. It permits the car to remain *locked together* as substantially as ever. No rocking—no side-sway—no loosening of connections between body and driving mechanism.

DANN SPRING INSERT COMPANY
2265 Indiana Avenue Chicago, Ill

The shock-absorbing Insert extends from tip to tip between every spring leaf. It places a shock and vibration dampener in *direct contact* with every square inch of bearing surface between these spring leaves.

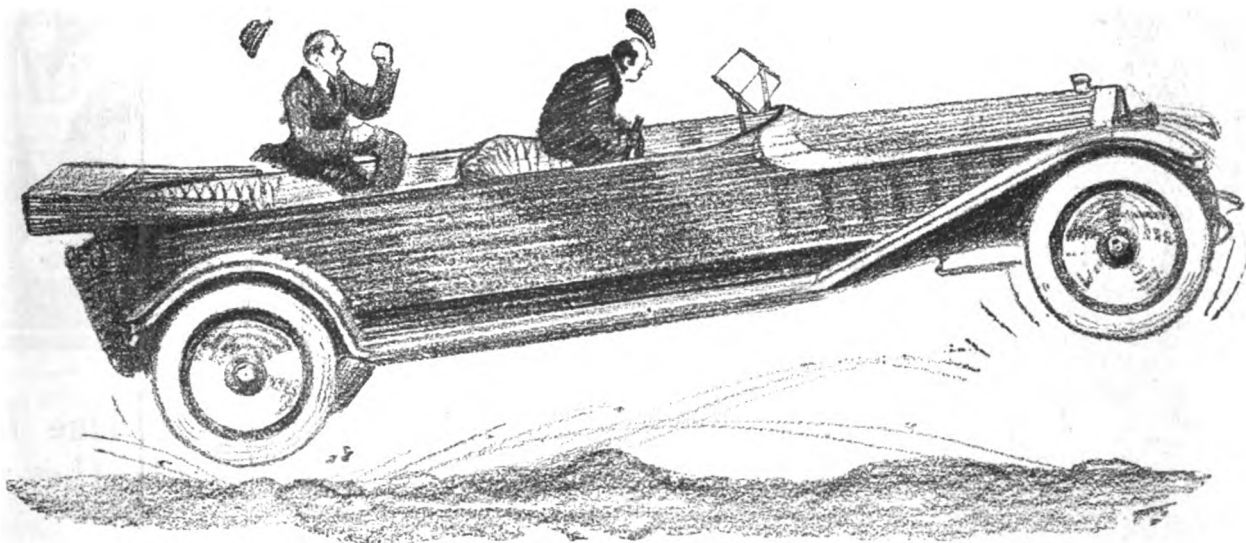
For these reasons DANN Insert is effective not at one point only as with ordinary shock absorbers, but effective *throughout the entire length and breadth of the spring*.

The thousands of perforations in the strips of DANN Insert are packed with a graphite compound. These little graphite pads *cushion* the series of jolts and shocks to which springs are continuously sub-

jected. These perforations in the Insert have a further effect in breaking up vibration. A shock cannot be transmitted in a direct line along the Insert strip—it must go *around* the innumerable perforations.

Strips of DANN Insert are of soft, *non-shock-conducting* metal. Now the highly tempered metal of which springs are made is an ideal shock and vibration *conductor*. But the soft metal strips of DANN Insert placed between these highly-tempered leaves act upon shocks much as strips of soft lead would. They smother

the shock—cut it up—render it harmless. DANN Insert in no way retards natural spring action. By furnishing a glassy smooth bearing surface between the leaves—by filling in the more or less uneven surface of these leaves with graphite compound—the flexibility and sensitiveness of the spring is *increased*.



Impossible? Yes, but this is what springs Try to do!

There is nothing gentle about a spring. When a jolt compresses it, a spring's only impulse is to whip every one out of the car as quickly as possible. A spring saves you from actual bumps, but not from being thrown about and not from vibrations--and vibrations are harder on your body even than bumps.

★ *Hartford*

SHOCK ABSORBER

Soothes the Angry Spring

Stretch a rubber band. Let it snap back. That's the way an uncontrolled spring works. Stretch it again and ease it back gently—that's the way a Hartford Shock Absorber *makes* a spring work.

The Hartford reduces spring-action to long undulating waves of motion—free from recoil, shock or vibration—even on the roughest roads.

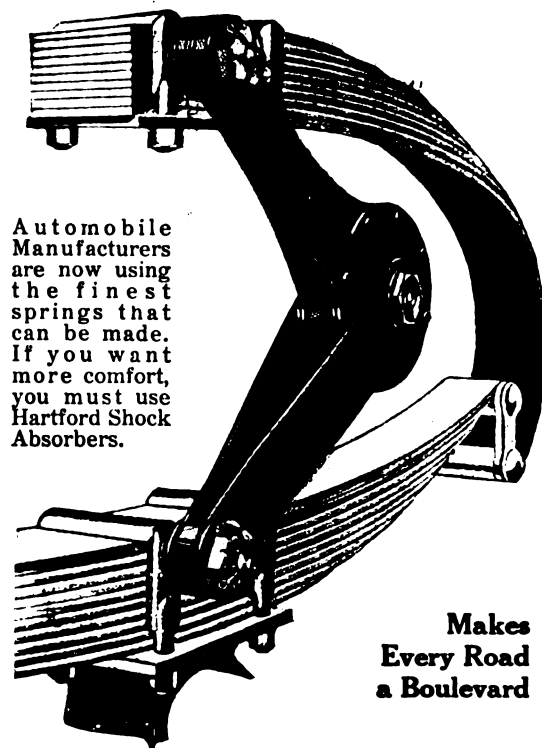
It makes motoring really comfortable. It prevents accidents by keeping the wheels on the road. It adds years to the life of machinery and cuts down repairs and tire bills.

Let us send you a book which will tell you why the Hartford Shock Absorber is standard equipment on so many prominent cars and why 95% of the racing drivers use it. The book is free.

HARTFORD SUSPENSION CO. E. V. HARTFORD, President
142 Morgan Street Jersey City, N. J.

BRANCHES: New York, Boston, Philadelphia, Kansas City,
Newark, Chicago, Pittsburgh, Indianapolis

*Formerly Truffault-Hartford



Automobile Manufacturers are now using the finest springs that can be made. If you want more comfort, you must use Hartford Shock Absorbers.

**Makes
Every Road
a Boulevard**

MATTSON

RUBBER ACCESSORIES

HIGH GRADE
BLOW-OUT
PATCHES

HOOK-ON
BOOTS
IN BOTH
CLINCHER AND
DUNLOP STYLES

HEAVY
MEDIUM &
LIGHT RE-
LINERS - ALL SIZES

RED
RUBBER
TUBING

RED (GUARANTEED) INNER TUBES

Three features distinguish the Mattson Line from every other you have been urged to handle. They are:

UTILITY:—

There is not a poor seller in the Mattson Line. Each unit of it is an article which motorists have constantly recurring use for. Each is as nearly a necessity as can be—none can be considered a luxury or a novelty.

Utilities are never dangerous to handle. The demand for such goods is constant, and the turn-over is quick. They simply can't stick to your shelves.

QUALITY:—

As good as the use of the finest raw materials, expert workmanship, modern equipment and strict attention to every detail of manufacture can compass.

PRICE:—

Ever since we entered the automobile field we have specialized on a line for the jobbing trade. We have been able to keep our overhead expense low and in many other ways have effected savings without sacrificing the quality of our goods.

Such practical economies have enabled us to make and maintain Mattson prices uniformly lower than any other line of anywhere near a like quality.

Ask about our Unguaranteed Tires Wrapped or Non-Skid Treads. The season of greatest activity is almost here. This is your opportunity.

Our Price List—sent only to jobbers—tell's the story

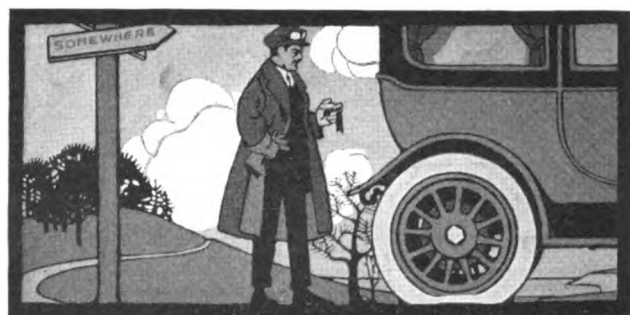
Mattson Rubber Co., 112 Main St., Lodi, Bergen County, N. J.



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Another Puncture!

It always happens at the most maddening time—just when you want to catch a train or keep some important engagement. And usually it isn't really a puncture at all, but a leaky tube.

Now porous rubber (so-called) and leakage around the valves are among the commonest failings of cheap, machine-made tubes. If you are tired of these needless "punctures" equip your car with Kelly-Springfield Tubes. They are made slowly and painstakingly by hand out of real rubber. They can be punctured, of course, but *they won't leak*.

If you use Kelly-Springfield Tubes in Kelly-Springfield hand-made, real rubber tires you will add increased mileage to freedom from needless tube trouble.

Send to 229 West 57th Street, New York City for "Documents in Evidence" which tells the experience of others.



Kelly-Springfield Tire Company

AKRON

OHIO

Branches in All Principal Cities

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EIGHT PAGES

Drama, Music, Movies,
Electrical and N. W. O. News

Toledo Times

ONLY MORNING AND SUNDAY PAPER IN NORTHWESTERN OHIO

TOLEDO, SUNDAY, MARCH 7, 1915

SECOND SECTION

EIGHT PAGES

Drama, Music, Movies,
Electrical and N. W. O. News

Making Room For The Largest Factory Building In The World

How Commerce Is Changing The Topography of Toledo Near Willys-Overland Auto Plant



PART OF
CREEK
BED
WHICH
IS
BEING
ELIMINATED.



LOADING A TRAIN OF DUMP CARS
WITH EARTH FOR FILLING-IN THE CREEK



REMODELING THE LANDSCAPE
ON THE OVERLAND PROPERTY

**MORE THAN \$1,000,000 IS
BEING SPENT IN BUILDING
TWO NEW GREAT ADDITIONS**

THE work now being done by the Willys-Overland Company preparatory to erecting the new additions made necessary by the company's rapidly increasing volume of business, will do much to improve conditions around Central Grove Park and the boulevard.

Already the course of the "Ten Mile" creek has been straightened and the work of eliminating the sick hole which formerly was an eyesore to Toledoans, has been practically completed.

An attractive concrete bridge is being constructed by the Overland Company to span the creek as a substitute for the old wooden structure which formerly required that part of the stream which has been eliminated. This will form a decorative feature of the park which adjoins the Overland property at that point.

More than 100 yards of what was formerly the creek bed have been filled in, the earth used for this purpose being taken from the side of a hill on the Overland property. The work necessarily hauling the earth for a quarter of a mile in long trains of dump cars.

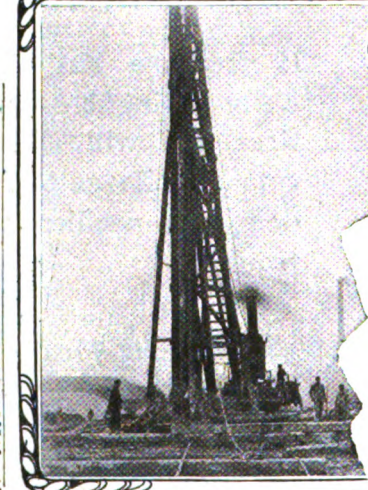
Front on boulevard.

The new buildings which are to front on the boulevard will be of a decorative order and will do much to add to the interest of a drive along the boulevard. Several hundred more are now waiting daily paying the ground for the building operations which will be started as soon as the leveling and draining operations have been completed.

The largest of the two new buildings will rank with the largest factory structures in the world. It will start at the park line and extend for 1,000 feet along the Overland property, facing on the boulevard.

This building will be 200 feet wide and will consist of two stories and a basement. The second building will be 100 feet square. Together they will contain 17 acres of floor space.

The new structures will look like complete factories in themselves, having considerably more than the



GIANT PILE DRIVERS WHICH SINK
FOUNDATIONS

Photograph taken on the scene gives some adequate idea of the immensity of the work which is being done. They show the type of activity which characterized the growth of the Overland factory site when purchased by Mr. Willys, to its enormous size of today.

When Mr. Willys purchased the Pope-Toledo plant in 1903, it contained 250,000 square feet of floor space and employed 450 men. Today the great Overland organization occupies what is probably the greatest influence in the city towards industrial progress and prosperity. In addition to the 3,400 men employed in making automobiles there is also the army of men working continuously upon new Overland factory buildings.

Spending More Than Millions.
More than \$1,000,000 is being spent on the newest additions. Since the start of the first enlargements to the original Toledo plant, in 1903, there never has been a time when at least half a million dollars worth of construction work was not in progress at the Overland factory. The continuous money spent in the work have gone to the workmen, contractors and architects - no have done the work and supplied the materials. The greater part of these millions have remained here and are being circulated in Toledo.

The influence of so great an industrial organization on the home city is an estimate that even carefully compiled statistics fail to give a really comprehensive idea of the situation. The three people of themselves would make a community greater than the average progressive American city. There are still others to be considered.

Hundreds of grocers, butchers, dressers, hatters, bakers and merchants are needed to provide them with the necessities, comforts, conveniences and recreations of modern life. Many Toledo merchants declare that without the Overland factory they would be absolutely unable to maintain their present establishments.

The influence of so great an industrial organization on the home city is an estimate that even carefully compiled statistics fail to give a really comprehensive idea of the situation. The three people of themselves would make a community greater than the average progressive American city. There are still others to be considered.

Growth Continues

Each week for six weeks has been larger than the one preceding and has broken all records.

This demand for Overlands obliges us to enlarge still further our already enormous plant.

With the completion of new buildings now under way, our Toledo plant will have 79 acres of floor space.

There are 4,000 Overland dealers this year. There are still a few open territories for next year.



Overland
TOLEDO, OHIO

"Made in U. S. A."

The Willys-Overland Company, Toledo, Ohio

When writing advertisers please mention Motor World

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, March 24, 1915

No. 12

"All He Made Was a Dollar and Thirty-nine Cents!"

But It Started a Better-business Movement Which Is Revolutionizing the Garage Trade in an Illinois Town

"**H**E was a pretty good garageman at that, but when he got through figuring he found that every time he took in one hundred dollars it cost him ninety-eight dollars and sixty-one cents."

"Good ——!" almost shouted a garageman in the audience. "A dollar and thirty-nine cents profit out of every hundred!" he added after a swift mental calculation.

Then the garageman began to scratch his head; over in the corner a garageman from El Paso began to do some deep thinking, and a big, brawny ex-mechanic from Bloomington began to wonder what there was anyway to this "business system stuff."

Started a Movement

All this happened something after this fashion in a recent convention of the Garage Owners' Association of Illinois, and the scratching of heads which was started by W. B. Taylor, of Rockford, when he read a few figures from a couple of sheets of paper, has not stopped; the Illinois garagemen are waking up; they realize there is something more to a garage business than punching a cash register and paying off the help.

What Taylor read was a report prepared by an accountant who is running a sort of garageman's and dealers' business school in Rockford, Ill. The tradesmen there have started a movement of business uplift, and the figures which Taylor read to his fellow garagemen were like a stone dropped into

a pond; the ripples have circled far and wide and Taylor is receiving requests to visit other localities and tell them the story of the Rockford Comparative Efficiency Group—which is what Account

ant Horace Edward Hollister calls it.

The Rockford Business Movement—which is a name it doubtless will bear in garage and dealer history—is one of the most remarkable things that ever happened in the retail end of the motor car industry; that half the men in a certain trade in one town should admit their business weakness, get together hire an accountant and tell him to find their leaks and losses and stop them and show them how to make money, is one bright spot in the trade's history—and it is unusual.

But they are doing it; and the businesses which are lined up in the movement are:

The Profit Seekers

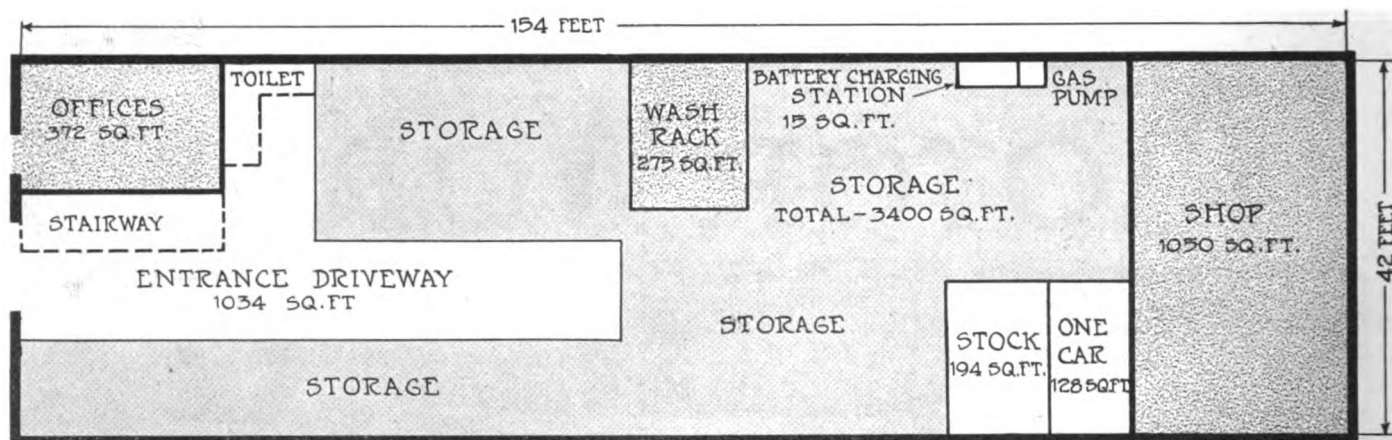
W. B. Taylor Auto Co.
Main Garage, L. J. Theiss.
Hutchin's Garage.
Phillip's Electric Garage.
Standard Garage.
Joslyn Automobile Co.

The latter company's proprietor, Jud S. Joslyn, is partially responsible for the movement. He delved into the systematizing of his business in advance of the others and from his work came the germ of the wider plan. His story was told in MOTOR WORLD March 3, and immediately after it appeared he began to receive requests from far distant garagemen for copies of his forms.

Accountant Hollister prepared forms and binders at the start of his work and instructed the various office workers how to enter the items of the businesses. Every few days he visits his



Every time \$100 went into the till of the B Garage \$98.61 went out—an excessive proportion of expense



Taylor takes account of every square foot of space in his garage and carefully computes that space which is overhead. The driveway, office, and stairway are charged against the other departments on a foot ratio basis

clients and is keeping a close watch on proceedings; he is anxious that there be no slip which will make additional labor for himself and others later. He also is a constant adviser of the men whom he is helping, and he is many times called upon to render assistance.

Then, each month he accounts each business and shows each garageman where he stands. The system includes costs as well as accounting, and is therefore more thorough than many other systems; also, both costs and accounting are coordinated; they are run together, so that the profit or loss in each transaction is revealed. The system employed is in some respects similar to that described the Joslyn story in *MOTOR WORLD* March 3.

Overhead a Stumbling Block

A big stumbling block with the garagemen, he found, was overhead; they did not know how to find it, and if they had found it it would have been in their hands like an untamed grizzly bear—"Now that you've got it, what are you gonna do with it?"

Therefore, one of his problems was the rounding up of all the items of overhead and proportioning it properly over the departments; most of the Rockford businesses are of such size that they are properly divided into departments. Also, one other thing he found—which was more verification than discovery—was that a repair-shop is a fine place to lose money. Stopping this loss has been one of his problems.

A single item which is illustrative of the reform which is being wrought is that of overhead space; any garageman knows that the driveway across the floor is perfectly good space, but if asked what department pays the rent for it—that is something else again.

In the garage of the W. B. Taylor Auto Co. the floor has been divided as is shown on an accompanying chart, and the overhead space is divided over the other departments on a foot ratio basis; if the overhead feet are, say, 600 and if the repair-shop occupies half the remain-



W. B. TAYLOR

After he read his report to the Garage Owners' Association of Illinois he was elected president, and he is now endeavoring to spread the gospel of better business

ing space the shop pays the rent on 300 overhead feet.

But to return to those figures with which Taylor startled the other garage-

men: One was a comparison of two garages, the A Garage and the B Garage, for want of real names—but they are real garages in Rockford. The table—which is shown elsewhere—told what the cost was in each department per \$100 of business—before the new systems were installed—and showed the cost per \$100 of sales for the whole business. In the A Garage the total cost per \$100 of business was \$96.10; in the B Garage, \$98.61. This left a per cent of profit in the one of 3.84 and of 1.39 in the other. The average was 2.61. These figures were what caused the sensation; if garages as good as these made so little money what could be the state of affairs in the hundreds of other not-so-good garages, some of which were represented in the room?

Showed Own Figures

Another set of figures was explanatory of the method of operation in finding the profits of Taylor's own business; he disclosed his real figures for the benefit of his fellow men. This revealed that while his business paid \$799.48 in one year the garage department lost \$622.33; the profit he should have made was cut in

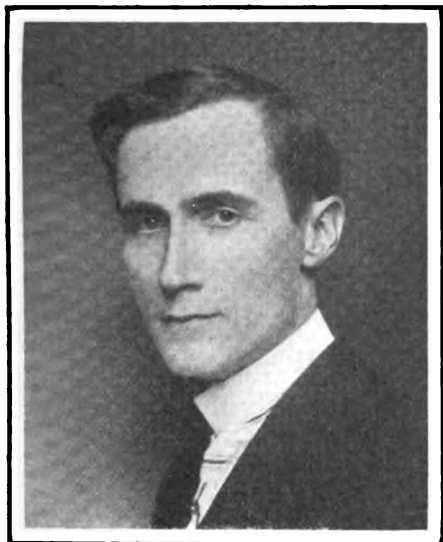
HOW TAYLOR PRORATES EXPENSE OVER DEPARTMENTS

	Gen'l Ex.	Garage	Stock	Repairs	Totals
Building	\$79.20	\$937.20	\$52.80	\$250.80	*\$1,320.00
Materials			9,937.47		9,937.47
Labor		377.63	77.62	3,852.22	4,307.47
Superintendence	450.00	600.00	600.00	1,050.00	2,700.00
Light and power	12.00	122.80	63.91	122.80	321.51
Heat	16.00	189.34	10.67	50.67	266.68
Water	5.00	40.00	5.00	10.00	60.00
Insurance			24.70	47.39	72.09
Personal taxes	3.28				3.28
Office salaries	344.00				344.00
Office expense	414.76				414.76
Miscellaneous materials		66.67	211.00	24.52	302.19
Gen'l expense totaled and prorated ..	\$1,324.16	264.84	264.84	794.54	.....
Total costs		\$2,598.48	\$11,248.01	\$6,202.94	\$20,049.45
Sales		1,976.15	11,882.66	6,990.12	20,848.93
Profit or loss		(Loss) \$622.33	(Profit) \$634.65	(Profit) \$787.18	(Profit) \$799.48

*Equals 9 per cent on \$20,000.

Costs include \$1,320 rent and depreciation on building and \$1,800 salary to owner.

half. Then Taylor explained how it had been necessary to raise the price of labor to square things up, and he was kept busy for a few minutes answering questions. Later on the Rockford efficiency group will be able to give some interesting comparative data.



HORACE EDWARD HOLLISTER
The accountant who is handling the figures of the six Rockford garagemen and dealers

IT COST THE B GARAGE \$98.61 FOR EVERY \$100 IT TOOK IN

	Car Sales	General Stock Sales	Storage	Repair Shop	Cost of Total Sales per \$100 of Sales
Housing: Building, Taxes, Insurance and Depreciation—					
A.	.....	\$44.00	\$48.90	\$3.58	\$5.95
B.	14	128.00	48.87	7.43	1.64
Average	14	86.00	48.88	5.50	3.79
Materials—					
A.	.....	85.43	34.00	.35	49.11
B.	98.18	73.35	5.14	16.76	78.16
Average	98.18	79.39	2.74	8.56	63.63
Labor—					
A.	.....	5.70	49.47	71.56	31.45
B.	8.11	8.67	43.33	67.97	11.95
Average	8.11	7.18	46.40	69.76	21.70
Heat, Light, Water, Power—					
A.	.....	.67	17.82	2.63	2.95
B.	58	.40	13.81	4.84	.68
Average	58	.53	15.82	3.73	1.82
Insurance and Taxes—					
A.	.....	21.00	....	68.00	35.00
B.	58	34.00	5.42	13.00	63.00
Average	58	27.00	2.71	41.00	49.00
Office Salaries and Expenses—					
A.	.....	2.23	13.40	11.38	6.35
B.	215	10.25	15.34	17.70	5.55
Average	215	6.24	14.37	14.54	5.95
Totals by Departments—					
A.	.....	92.90	129.59	90.18	96.16
B.	100.16	94.29	131.91	94.93	98.61
Average	100.16	93.59	130.75	92.50	97.38
					% Profit
					3.84
					1.39
					2.61

At the bottom of the last column at the right are the costs per \$100 of business of the A and B garages and the average for both—A, \$96.16; B, \$98.61; average, \$97.38. The difference between these figures and \$100 gives the per cent of profit, shown at the extreme lower right

Officers of the Minneapolis Automobile Trade Association



1—L. E. Horton, vice-president of the association since its organization and one of the partners of the Northwestern Cadillac Co., Minneapolis.

2—H. E. Pence, president of the Pence Automobile Co., Minneapolis, and president of the association since its organization.

3—D. A. Odell, director of the association and proprietor of the D. A. Odell Motor Car Co., Minneapolis.

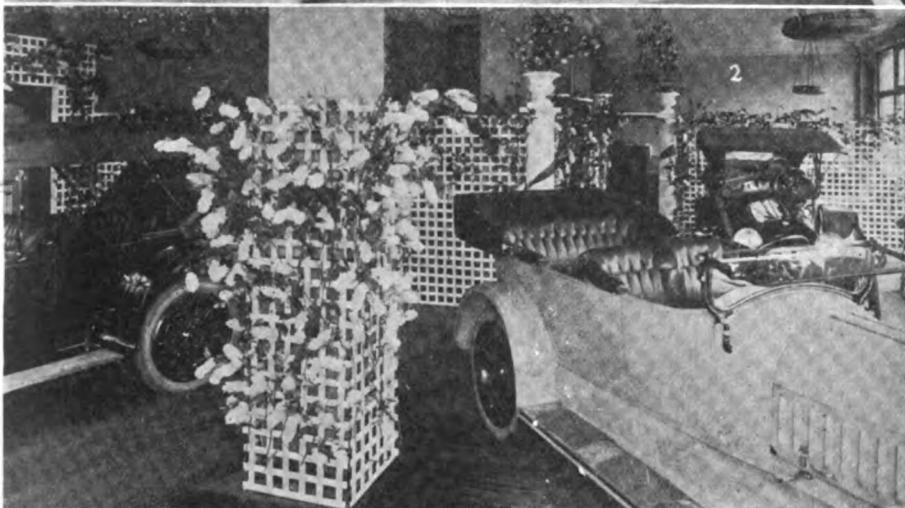
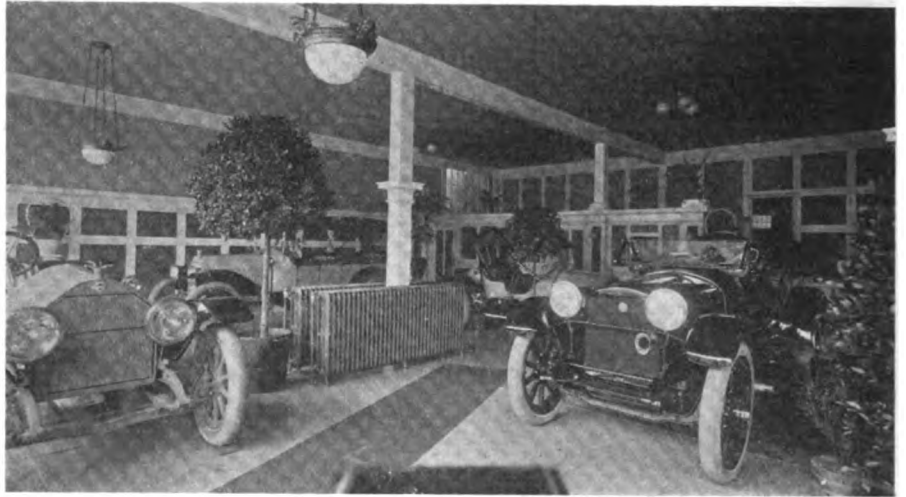
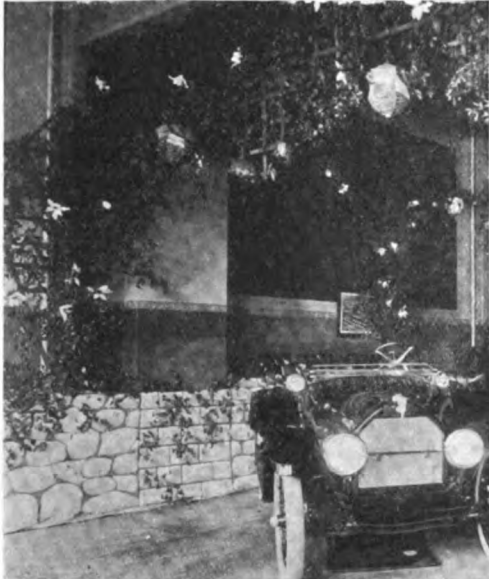
4—Wm. E. Wheeler, treasurer of the association and president of the Northwestern Automobile Co., Minneapolis.

5—Frederick E. Murphy, secretary of the association since its organization and owner of the Frederick E. Murphy Automobile Co., Minneapolis.

Indianapolis Salesrooms Blossom Out in

Business Places Along the Row Made Attractive With Potted Plants and Are Displayed—Cost in Most Cases

SOME INDIANAPOLIS SALESROOMS
DURING SPRING OPENING WEEK



THIS year as in the past two, the Indianapolis show was in the form of individual displays by the various dealers of motor cars and accessories, show rooms being decorated according to the individual tastes of the dealers.

One of the best displays was the Marmon salesroom (2) which was decorated in imitation of a California garden. Manager A. B. Wagner had the large posts surrounded with lattice work of wood, painted white, and around the wooden portion, paper lilacs and smilax were wound. Intermingled with the paper flowers were miniature lights which were switched on and off by means of Shedoodle sockets made by the Phelps Mfg. Co., Detroit.

The illustration shows the large amount of lattice-work walls which were used and the white pillars at the ends of these walls. These pillars were made of corrugated paper and on top was a piece of flat board to support a plaster vase. The indirect lighting bowls also were decorated with flowers and leaves. The following shows the cost of the display not including the work of installation:

Flowers	\$19.00
Vases	10.00
Paint for the parts.....	1.70
Lumber	20.00
Light sockets	1.50
Professional window trimmer.....	12.00

\$64.20

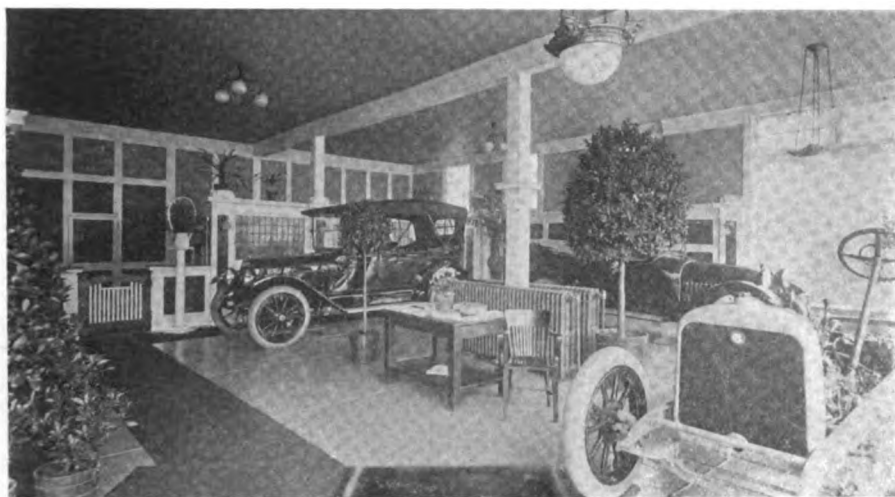
Add to this about \$4 for the services of one of the shop men and the total for this unusual display comes to \$68.20.

The Conduitt Auto Co., Peerless, Stutz and Chalmers dealer (upper two pictures) had a display which cost only \$25 complete. The properties were rented shrubbery in various-size pots. As with other rented displays which cost in the neighborhood of \$25 for the whole week, the florist watered the plants every morning and cared for them in every other way necessary.

The National agency (6) used American flags to a great extent, trimming the wall pillars with flowers and leaves. The trophies won by the National company were on display and the arrangement of cars on the floor gave lots of room for the visitors to walk around. The chassis was placed in the center of the floor as the big attraction and finished cars were well-placed around it, as shown in the illustration herewith.

Annual Spring Opening Week Exhibition

Other Green Things Serve to Draw Prospects Indoors Where New Cars
Is Low and the Decoration Pays



DECORATIONS THAT ARE TASTEFUL
BUT ARE NOT TOO OBTRUSIVE

good impression and cost only \$32, because of the fact the greater part of the properties were rented from a local florist. These consisted of a num-

The Buick show-room (3) gave an exceptionally ber of potted plants, white clay pedestals, smilax sufficient to decorate the ceiling and some natural flowers. The smilax alone cost \$16 and the rental of the rest of the properties \$16. All the properties were cared for by the florist so as to make the show-room look as attractive on Friday as it did on Monday when the show opened. On the floor were various models of the Buick line, so arranged that the visitors got a good view of each.

In the Cadillac salesroom (5), which throughout the year is brightened up with fern pots costing about \$250, there were additions made in the way of paper flowers for the indirect lighting bowls and other lighting fixtures on the walls. The rear portion of the ceiling also was decorated and on the whole the display was very attractive. Aside from the ferns mentioned, the cost of new material was \$50. In the front of the room was a chassis of the Cadillac eight, and a factory man gave lectures every few hours on the merits of the car.

The Fisher Automobile Co., agent for Packard and Reo cars (4), had a display similar to that of the Cadillac, in that a number of ferns in pots were placed on the floor on each side of an aisle made by a long carpet approach. The lighting fixtures were well cared for by decoration with artificial flowers and leaves, and the balcony in the rear of the room was well-covered with greens. All of the properties were rented and cost slightly over \$20.

One of the most costly layouts of all the shows held by the various dealers was that of the Gibson Automobile Co. (1), agent for Overland cars. The properties for this show cost in the neighborhood of \$250. This is largely attributed to the fact that the walls were covered with an imitation stone wall made of asbestos properly painted, as shown in the illustration herewith. A Japanese garden motif was the desired effect and it was well-worked out by the use of lanterns and much lattice work for the ceiling cross-beams. The smilax, which was not imitation, and the real roses and orange flowers cost about \$175. Some of the natural flowers had to be changed before the week ended. Overland cars were arranged in rows along both sides of the room and a chassis was in the center.



Faces Seen at Harrisburg's "Old Original" Show



1—M. E. Schlegel, Thompsonstown, Chalmers and Buick. 2—W. J. Fetter, Seven Star Garage, Carlisle, Overland. 3—George R. Bentley, Riverside Garage, Paige. 4—Andrew Redmond, Overland, Chandler, Autocar and Willys-Utility; association director. 5—R. J. Church, salesman with Crispen Motor Car Co. 6—Edward C. Huhn, sales manager of the automobile department of the Keystone Lubricating Co., Philadelphia.

7—R. R. Bender, vice-president and general manager, and (8) J. F. Trace, sales manager, of the Union Sales Co., Inc. 9—C. R. Morton, Chalmers, Dodge and Saxon. 10—George F. Snyder, Chambersburg, Chalmers. 11—Don Miller and (12) T. C. W. Hobbs, with W. C. Robinson &

Son, grease, oil and soap. 13—The "old and original show" was held in the building in the background bearing the small show banner; the rival show hung a big banner across the street in the foreground as competitive advertising.

14—W. H. Sidle, Dillsburg Garage & Auto Supply Co., Dillsburg. 15—J. A. Plank, Plank-Werner Tire Co. 16—J. J. Hargest, Rex Garage. 17—J. Clyde Myton, show manager and secretary and treasurer of the Harrisburg Automobile Dealers Association, and (18) the same man again minus the overcoat. 19—Frank B. Bosch, manager of the Sterling Auto Tire Co.

20—C. M. Hawk, with the Rex Garage. 21—"Starkey," the ticket taker; his name is George L. Stark. 22—B. E. Stoner, salesman for I. W.

Dill. 23—George G. McFarland, Harrisburg Automobile Co.; Reo and National; president of the Harrisburg Automobile Dealers Association. 24—Warren Unger, Shamokin, Chevrolet and Reo. 25—C. C. Crispen, Crispen Motor Car Co., Cadillac; association director. 26—Embryonic Harrisburg dealers, who are strong for unity, harmony, one dealers' association and one show. 27—T. M. Byer, salesman for Crispen Motor Car Co. 28—V. H. Lane, Jr., Detroit; he is one of the Cadillac lecturers whose voice has blocked the aisle at many shows. 29—R. D. Caley, Tire Shop; with the exhibit of the City Auto Supply Co. 30—I. W. Dill, Hudson; association director. 31—F. E. Devlin, Hudson district sales manager, Philadelphia.

Some of the Exhibitors at the "Rival" Exhibit



1—E. M. Hottenstein and (2) George B. Zech, Hottenstein & Zech, Buick and Chevrolet. 3—Theodore Josephs, Cochran Pipe Wrench Co., New York City. 4—Earl Riidiger, who ran the candy stand. 5—C. E. Hoin, Roberts & Hoin, Haynes

6—H. S. Wagner, Palmyra, Buick and Chevrolet. 7—P. G. Hottenstein and (8) J. M. Evans, salesmen for Hottenstein & Zech. 9—A. G. Mosher, City Auto Supply Co. 10—D. R. Ream, the "son" in Ream & Son, which handles the

Mitchell in Harrisburg and the Mitchell, Ford,

Maxwell, Regal and Vim truck in Palmyra. 11—E. J. Cavender, Commercial Car Co., Brockway trucks. 12—E. W. Shank, Maxwell, vice-president of the association. 13—W. A. Davidson, Maxwell salesman, Philadelphia. 14—Each show had a big banner downtown. 15—H. H. Warren and (16) George E. Hoffman, Warren & Hoffman, Arendtville, Chevrolet

17—L. G. Monn, of Monn brothers, Metz Sales Co. 18—George W. Roberts, Roberts & Hoin,

Haynes. 19—W. Clifford Johnson, official car duster and all-around handy man at the show. 20—George A. Dechant, president of the Capital City Motor Dealers Association; Case branch manager and manager of 256 dealers

21—Victor Faford, Case mechanic. 22—W. O. Haney, Regal wholesale manager, Philadelphia. He wasn't quite ready this time so he faced the camera again (23) after he was "all set." 24—A. C. Hulshizer, manager, and (25) E. A. Donovan, sales manager, Bettern-Air Co., Philadelphia

Harrisburg The Center of Rich Territory

Nearly \$700,000,000 of Farm Land in 100-Mile Radius—Dealers in 24 Counties Draw From Population of Million and One-Half—Farming and Mining the Governing Factors.

HARRISBURG, March 20.—Situated in the very heart of the rich agricultural and mining districts of Pennsylvania and with its almost unexcelled facilities for distribution, Harrisburg has rapidly grown into one of the large automobile centers of the East. The two automobile shows which closed here tonight greatly emphasized this fact, as the record for sales was far above that established in former years.

Pioneer in Show Work

Harrisburg, with its population of 75,000, has 32 active automobile agencies, an increase over last year of 12. It was one of the first of the interior cities of the East to hold a show, the first being held in 1909 with only seven dealers in attendance. However, it would seem that a step backward was taken this year when the dealers split and two shows were held. It was not for lack of space in one building, but was brought about through a feeling of the younger members in the automobile business that the old association was not according them fair treatment.

The split this year, and the rival shows within a block of each other, brought forth ill-feeling between the two bodies; the Capital City Automobile Dealers Association, being the name of the new organization. The public did not take kindly to the division of the display, and of course neither show was as large as those of the past few years.

Older Show Draws Best

There was little difference in the attendance at the two shows, the total for the week reaching 15,000. Each show did its proportion of business, but the older show, with its dealers established for years, and with many agents scattered throughout the territory of Central Pennsylvania, had a decided advantage in sales.

The Harrisburg show is not only a distributors' show, but an owners' show. Many cars are sold at retail during the week, and most of them go to the surrounding farm and mining territory, although there are many city folk who wait

until the early spring to place their orders. It is the custom of the dealers in the outlying territory within 100 miles of Harrisburg to bring their prospects to the show and many sales are closed on the floor before they return to their homes.

One dealer from Berwick brought ten prospects to the show and closed up six sales. This same dealer closed an order for eight carloads of Reo cars and will have them shipped on one train into the rich coal regions, thus affording a display that in its small territory will outdistance the efforts that factories have been making with their large trainload deliveries. Another dealer placed an order for three carloads, and there were many carload orders from the sub-dealers and agents in the territory. One agent with 41 dealers has already received orders for 411 cars against 187 sold during the 1914 season.

Truck Exhibit on Curb

At the two shows there were 34 different makes of cars exhibited and 67 cars were used in the displays. Trucks and commercial cars were not allowed in the exhibit halls on account of lack of space, but the dealers used the curb for their truck and commercial car display, and from twelve makes represented a number of orders were booked. In some cases the big show displays were shipped from the Boston show to Harrisburg and there were a number of highly polished cut open chassis and display parts of the better known cars, like the Cadillac, Hudson, Maxwell, Paige, Reo, Overland, Studebaker, Chalmers and Chandler. There was only one electric on show, Harrisburg not being a fertile field for this type of car.

No better territory can be found in the East than that opened to the Harrisburg agency. On the north and to the east are the rich mining communities, while to the southeast is Lancaster county, the richest agricultural county in the United States, and on the west is the beautiful and rich farm country of the Cumberland valley. And these two fields form the golden yield for the Harris-

burg dealer. The farmer and the miner are buying cars in great numbers, and the majority wait for the Harrisburg show before placing their orders. It has become the custom of the city dealer to go to New York or Philadelphia to look over the cars at show time, but to the outlying districts the local show is all important.

There is no season that stands out above all others for the Harrisburg dealer. In the tobacco belt of Lancaster county the farmer sells his tobacco crop late in the fall and this money goes for his automobile at that time. In the agricultural counties the returns for the crops come in the fall and with fair winter roads the farmer does not wait until the opening of spring to place his order. In the coal field the winter brings forth the great demand for coal and the mine superintendent is kept busy at that time, and thus orders for cars come at all seasons of the year.

All-year-round Business

It is no uncommon sight to see the Mennonite, or the "plain people," in some of the surrounding territories driving their automobiles over the country roads, and using them on market days to bring their products to market. In the mining field, where a foreman once covered three or four mines in a day with horse and buggy, he is given three times the territory and quickly covers it by automobile. And the shifty miner, the man who works beneath the soil, has also fallen into the ranks, and many of the more prosperous ones are automobile owners. Trucks are also finding their way into the mining fields and among the farmers who do extensive wholesale market business.

This fall business is mostly for the medium-priced car, but many of the higher-priced sixes find their way to purchasers at that time of the year. It was no uncommon sight at the show to see a farmer studying the chassis and finally making a selection and bringing forth real money to pay for his car right then and there. And the farmer knows what he wants even to a greater extent than the city buyer. Pennsylvania has 219,295 farms, approximating 21,000,000 acres, assessed at \$1,041,068,755, and over 70 per cent of it is improved land. The average farm runs in size from 85 to 90 acres.

Farmer an Important Factor

The territory covered by the Harrisburg district is in the richest center of all this farm land, and while covering about 18,000 of the 45,000 square miles of the state, it can be safely said that \$700,000,000 of farm land is within the 100-mile radius. In addition, the population of the 24 counties covered by the various dealers has a total of 1,756,000 inhabitants.

Dealer Associations Cannot Enforce Prices

Making an Ironclad Anti-Price-Cutting Rule of No Avail, Meck Advises Men About to Organize

By Ray W. Sherman

THE dealers of Silver Creek county had dined satisfyingly if not sumptuously on a Dutch layout in the one popular eatery in the Village of Silver Creek and sat back over their coffee in a rapidly thickening haze of bluish smoke; it beats all what sauerkraut, pigs' knuckles, coffee and a cigar can do to a man's disposition. Whatever discord there may have been had vanished before the contented, beaming countenances. Down at one end of the table and viewed from where Tom Meck, Reilly and the Sales Manager sat, ruddy Ben Probst looked for all the world like that well-known Cheshire cat; about all that was visible was Ben's grin, and even that was being faded by Probst's vigilant stoking on his big black Havana.

They Wanted Advice

The situation was this: The Silver Creek county dealers were going to form an association, but they wanted some advice; they were willing to take it from anyone—so long as it didn't cost anything—and the Sennett dealer in the district had appealed to the Sales Manager; not that he thought the Sales Manager knew anything about organization but rather because it was up to Barclay, the Sennett man, to get somebody down to the dinner to make a speech.

Barclay didn't know much about dealer and trade organization, and the Sales Manager knew less, so the latter sicked Barclay onto Reilly, who was reputed to be a king bee in the Callawassa Motor Trades Association. Reilly was almost booked for the date when Tom Meck, a western district man for the Sennett, blew in—and Meck got the job. Meck had mixed up with a whole bunch of associations out in his territory and, being a good Irishman, always mixed in when possible.

Before and during the dinner Meck had talked with several of the leading spirits in the movement, and he knew very nearly what troubles lay back of the gathering; for his information it was

not necessary that several of the Silver Creek men make preliminary addresses on the trade problems of the community, but they did so because Big Ben Probst, the chairman, asked them to. Then Meck—with everyone staring at him—got up.

"It will be one of the best things you ever did," he said, after a few preliminary witticisms and generalities. "If you all get into an association and stick by

compelling force against it. Don't make it a rule of the organization that a member cannot cut prices."

The faces of the dealers fell. This had been one of their brightest hopes. Some of them wanted to say something—but they were all too weak to make a noise. They were astounded that the emissary of a price-maintaining corporation should make such an assertion. Meck knew it would work this way, and when he saw the glum look pass around the board he smiled and added:

"I knew you wouldn't get me when I said it." He laughed, and one or two tried to smile. "I am not in favor of price-cutting," was his paradoxical continuation, "but you cannot enforce price maintenance through the rules of your association. It would be fine if you could—but you can't!" And Meck rapped the table.

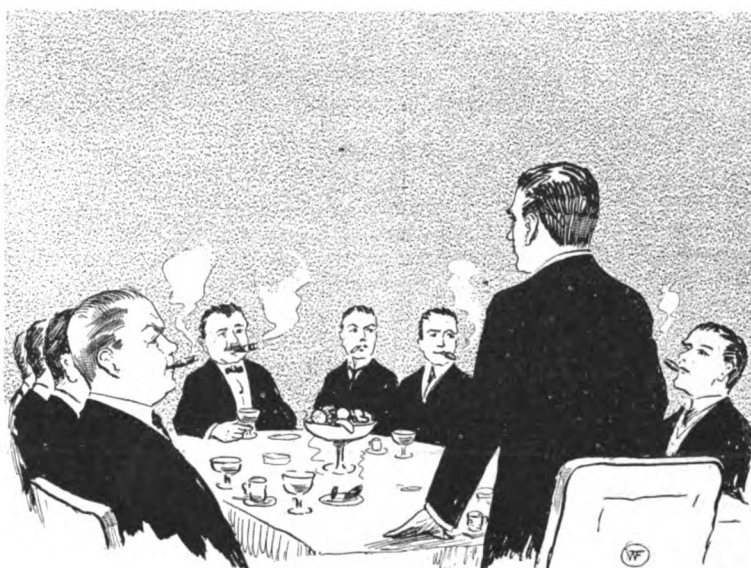
It Can't Be Done!

"In handling the cut-price situation you are doing a good thing in getting together, and it ought to help solve the problem in the end, but don't try to swing a club over the heads of your members

the first thing you do. I have seen it tried too often with bad results.

"Very often a group of dealers will try to get together on an agreement not to cut prices, but I never yet have known one to work out. No matter how reliable the men are otherwise, no matter how much they may believe in the principle, they won't abide by an agreement not to cut prices; it can't be done! Not that way, anyway.

"I know of one association in particular that comes to mind at this moment. It was in the little city of Honita, out in the West; the dealers, garagemen and supplymen—they are all one and the same—recognized the evils of price-cutting and a few other things and formed an association. One of their first moves was to draw up an agreement not to cut prices a single cent; every one signed it. There were other association matters, but this was the big thing.



"Attached to the agreement was a by-law to the effect that any member who violated the rule should be fined two hundred dollars. What was the result?"

it, it will yield you a solid silver dollar for every ounce of energy you put into it. I have talked with quite a number of the boys here this evening and am more or less familiar with the problems which confront you, and before going into detail in any advice as to how to organize I want to touch upon certain points. One of these is price-cutting."

They Were Anxious

There was a brightening of the faces of those men who had been grabbing the bread out of their own mouths and throwing it away. They were anxious.

"Price-cutting has been one of the evils of the trade in this county, so I am informed," he continued, "and it is commendable in you all to want to get together and stop it; but I want to advise earnestly against the course which some of you have believed best, and that is, making the association a

"Attached to the agreement was an association by-law to the effect that any member who violated this rule should be fined two hundred dollars, which was to go into the organization treasury, and if at any future time the organization disbanded the money in the treasury was to be divided among the members then in good standing. What was the result?"

"The members had always been suspicious of one another, and the mere fact that they had formed an association hadn't made them well enough acquainted to eradicate this suspicion entirely. They were still afraid the other fellow would try to put one over. Each man was afraid the other man would cut under him if he tried to get the list and get some of his business. So right off the bat they all kept on cutting and waiting to see how the thing worked out.

Caught With the Goods

"Naturally, one or two of the members, who had more organization spirit than sense and who believed the thing would work, started to spy on the others, and it wasn't long before they got the goods on a man who was selling a well-known car. According to the system they presented their evidence to the president, who called a meeting and put the matter up to the price-cutter who had been caught.

"They were so high-handed in their handling of the price-cutter that it made him sore, anyway, and he finally said, 'Yes, I cut the price! What are you going to do about it?' 'Fine you two hundred dollars,' announced the president. 'Fine and be damned!' was the member's answer, as he put on his hat and went out the door with his thumb at his nose.

"What could they do? They had caught the man and assessed the fine. The scheme worked great up to that point—and that was the end of it. And each man in his heart knew he was just as guilty as the man they had tried to fine for doing something the rest of them hadn't been caught at. The asso-



"Fine and be damned!"

Manages All Departments of a Business



During the absence from his garage and salesroom of Charles J. Moody, Elgin, Ill., all departments of the business are managed by his daughter, Miss Ettie Moody. She is accountant, detail manager, saleswoman, and is besides an expert driver. She recently purchased a Saxon six for her own use. She has sold a fair percentage of the cars disposed of in the Moody salesrooms. One of Miss Moody's weekly duties is to read *MOTOR WORLD* from cover to cover and call to the attention of her busy father the things which she considers of greatest interest to him. The repair department employs 8 men and is one of the best in Illinois outside Chicago.

ciation was as yet a baby, and it was trying to swing a club."

"Well, what are you going to do about it, then?" inquired a rural tradesman.

"If you men don't want to stop cutting prices you can't do anything about it!" shot back Meck. "Do you suppose ninety million people all of whom wanted a Democratic president could elect a Republican? They would all vote for the Democrat, wouldn't they? So unless you men really want to stop cutting prices you had better drop that subject. But—" and Meck leaned on one arm and pointed with the other hand "—if you want to stop you can do it."

"How?" shouted half a dozen.

It Can Be Done

"Through your organization!" replied Meck. "You have other things on which you can get together—city ordinances, state laws, your annual show, and many other things. You can all work there without stepping on each other's toes. Get together and make an organization. Get the thing in working order. Have something to fight for and stand shoulder to shoulder and fight for it. Do some of the other things! If you do that you will get acquainted with one another in a manner possible in no other way. You will gain confidence in one another and acquire a mutual respect! And then—" Meck paused an instant "—you can do something with price-cutting.

"At all stages of the game you can agitate and talk against price-cutting, and as your association becomes stronger your educational propaganda will have greater weight. By continually pointing out the self-harm that comes from price-cutting and the folly of it you will build up a sentiment against it and in the end this ought to win out.

Find Where You Get Off

"And here's another thing! Go into this matter of business methods. If each one of you men had the right sort of business system in his place of business he wouldn't dare cut prices. The margin on most goods is so small now that if you cut you lose money. If you had a system that showed you where you got off you would no more cut a price than you would rob your family of food, and that's what you do when you—"

"How about long discounts?" asked Ben Probst, once more smiling.

"Long discounts are bad, but they do not apply generally. On some things that is made an excuse for price-cutting, but I won't discuss that. What I will say is that on most of the cars that are sold in this county the discount is not very long, and it's up to you to get it rather than throw away your profits trying to reform a whole industry—"

"Hurray!" shouted an enthusiast, and the once more beaming dealers echoed the sentiment.

New G. R. C. Rim Is Balanced

All Bolts, Nuts and Other Loose Parts Replaced by Simple Toggle Mechanism—Rim Transversely Split But Substantially Mounted—Wire Wheel With Quadruple-laced Spokes Also Brought Out

By way of eliminating the damaging effect of excessive and unbalanced weight in rim equipment, the General Rim Co., Cleveland, O., has perfected and now is placing on the market a new type of demountable-detachable rim designed to overcome this fault without in any way sacrificing the factor of safety. Combined with this is a simple and effective arrangement for attaching the rim to the

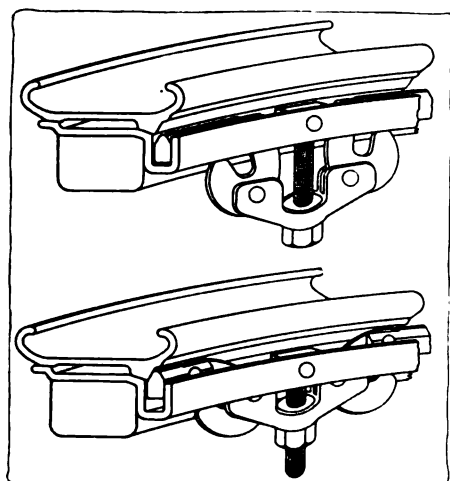
necessary to reduce wheel and rim weight as far as practicable and also to balance the moving parts.

"In the new rim produced by the General company the tire-carrying rim is attached to a wheel band by means of an expanding ring located in a groove forming the front portion of the wheel band. This ring engages the front surface of a supporting bead, on the under surface of the rim. The ring is expanded or contracted by means of a toggle device, operated from a single point. The wheel band and ring are assembled as a unit, and when applied to wheels there are no other parts to be considered except the tire-carrying rim.

"The tire-carrying rim consists of a single piece section (either clincher or straight side interchangeable on the same size wheel band) cut transversely at one point, the cut or split being joined together by a clip attached to the under side of rim end on one side of the split, the clip having its opposite end upturned to engage a slot on the other side of the split. When the rim is in its closed position a swiveled lever engages the clip which locks the rim in its circular shape.

"Objections to other types of split rings on the ground of weakness are overcome," it is pointed out by Moyer, for the following reasons:

"The rim is supported around its entire circumference by the wheel band,



Two views of the toggle mechanism, showing rim expanded and contracted

wheel band which eliminates all nuts, bolts, wedges or other loose parts. At the same time the company is marketing a quadruple-laced wire wheel designed to carry this rim equipment.

Although it has not always been customary to take into account the weight of the spreader, valve stem, nut, dust cap, etc., with which every pneumatic tube is fitted, general manager F. Hughes Moyer of the General Rim Co. points out that, "Any automobile wheel, not in perfect balance, has an unbalanced action, when rotating, which resolves itself into a pound on the tire in varying amounts, depending upon the speed and the amount it is out of balance. No matter what speed is attained, if the weight of valve parts is not balanced there will be a corresponding pound on the tire, every revolution, in direct proportion to the speed and the amount the wheel is out of balance.

"From which it follows that in order to obtain maximum tire mileage it is

including the portion at the 'split.'

"The ends of the rim at the 'split' are supported and lined up by means of the wheel band and expanding ring, making a smooth joint which cannot injure the tire.

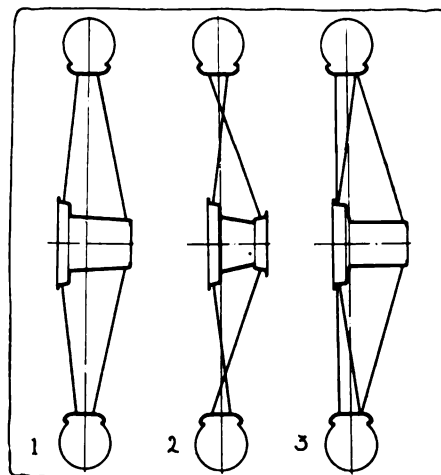
"The side flanges of the rim are drilled to receive a single acting rim tool which draws the rim to a smaller circumference for removing tires.

"The rim tool automatically locks the rim in position to receive a new tire.

"Long pins on the clincher rim tool force the tire bead from under the clinch on the rim, preventing cutting of the bead when removing the tire.

"The toggle device in connection with the demountable feature is operated with a ratchet wrench requiring only 15 seconds to lock or unlock the rim around the entire circumference.

"The toggle device for operating the expanding ring is located directly opposite the valve parts, balancing their



Figs. 1, 2 and 3, showing three methods of lacing wire wheels

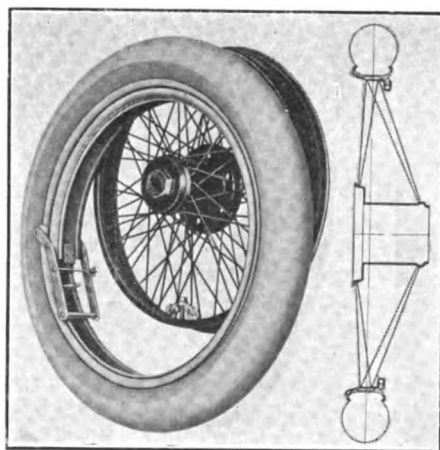
weight without adding unused dead weight to the rim.

"A set of rims comprises four wheel bands assembled complete with expanding ring and locking device; five tire rims; one tire detaching tool, and one ratchet wrench.

"In the new G-R-C wire wheel the spokes are in four planes, so designed that every spoke in the wheel can and does take its share of side strain, producing a wire wheel in which all strains are balanced. Rim and wheel construction is covered by patents or patents pending. The method of lacing is as follows:

"Front of rim to front of hub; front of rim to rear of hub; rear of rim to rear of hub, and rear of rim to front of hub, forming a lacing, braced in all directions, in which all strains are balanced.

"In order to illustrate clearly the points in the four different types of wheels mentioned, the accompanying diagram shows the application of the



Left—Attachment of rim to new G. R. C. wire wheel. Right—Fig. 4, showing quadruple lacing of the wheel

same number of spokes to produce different strength of structure:

"Fig. 1 shows the original form of lacing as applied to automobiles. Fig. 2 shows the cross bracing which followed later. Fig. 3 shows the partially braced construction. Fig. 4 shows General Rim Co. lacing.

"Considering wheels of the four types, each having the same number of spokes, laced as shown in the four different figures," Moyer points out, "we find the following:

"All four types will carry the same vertical load. All four types will carry the same driving load. All four types will carry the same braking load. The wheel shown in Fig. 4 is the only one in which the full value of each spoke can be utilized to resist side strain, and in which side strain is balanced.

"Referring to the physical properties of wire wheels, much has been said concerning the resilience of wire wheels in comparison with wood wheels. A wooden

wheel is built entirely in compression, due to the fact that it is assembled as a unit and drawn into shape and held there by the application of a steel band shrunk into position to hold the wheel together. Any load placed on a wooden wheel is carried by the spokes below the center of the wheel to the hub and in a direct line from the point of contact with the road to the center of the wheel.

"A wire wheel is built with the spokes in tension, and the rim in compression, the whole being held together as a unit by the tension of the spokes. Any load carried on a wire wheel is carried by spokes above the center of the wheel, which adds to the initial tension due to stringing. Consider a wooden wheel in service, fitted complete with tire. Every time the wheel drops into a rut or strikes an obstacle in the road the shock is transmitted directly to the hub of the wheel through the spokes below the center of the wheel, causing a blow at that point. Realizing fully that 'for every ac-

tion there must be an equal and opposite reaction,' this blow is returned directly to the tire at the point of contact, which has its effect on the tire.

"Consider a wire wheel under the same conditions. The shock cannot reach the hub until it has passed through the rim below the center of the wheel and must be further transmitted through the spokes above the center of the wheel before it can reach the hub.

"Buffing through any solid material absorbs shock, consequently the shock received at the center of the wire wheel is much reduced. The reaction—much reduced—has to pass through the same path before reaching the point of contact, with the result that the shock is partially absorbed in the wheel itself and the reaction at the point of contact with the road is materially reduced.

"In other words, the wire wheel is a shock absorber, placed at the very lowest point in the car, and also benefiting the tires."

Higher Air Velocity for Economy in New Schebler Carburetor

Needle Valve, Moved Down to Open, Is Submerged, and a New Dash Control to Facilitate Easy Starting Has Been Added

A new Schebler carburetor, styled Model S, has been brought out by Wheeler & Schebler, Indianapolis. The new device has some parts similar to the Model R which it supersedes, but incorporates many new features.

The single needle valve, or metering pin, is moved downward to open instead of upward, as in the Model R, and the needle adjustment has been eliminated from the air valve and placed on the opposite side. The venturi tube now has an extension in the form of a brass tube as shown in the sectional diagram herewith, this extension being intended to increase the velocity of the air at the point where the fuel is taken, thus making for economy and power.

In the new Schebler the needle valve is submerged; that is, the metering point is below the fuel level in the float bowl. This practice is used abroad to a great extent to simplify the problem of making the gas flow proportional to that of the air.

A new starting device is in the form of a dash-control which pushes the needle down and holds the auxiliary air valve closed, allowing of a rich mixture being taken into the cylinders.

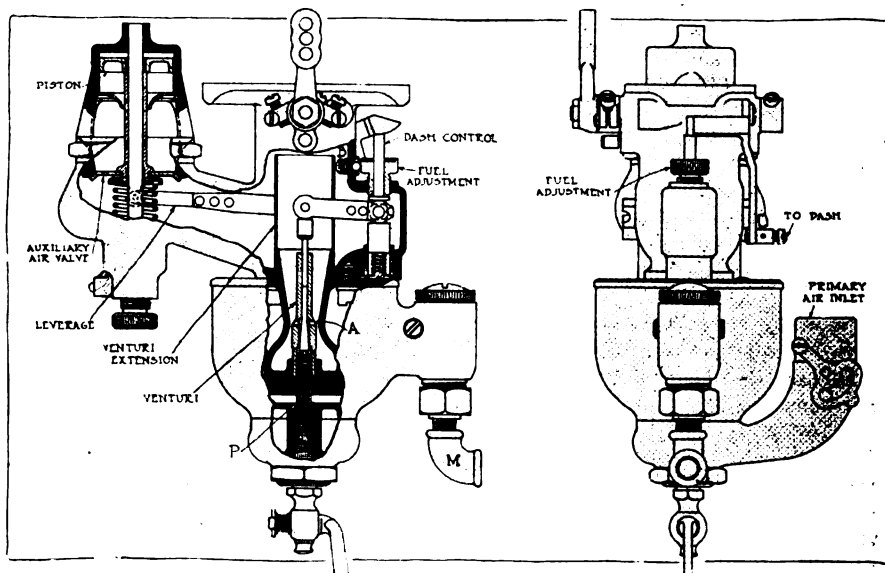
The fuel entering through M passes into the float chamber and up through the passage P to the tapered metering pin, the position of which will determine the extent of the fuel opening. The air rushing in through the primary passage exerts a high suction at the point A.

where the fuel passes from the jet to the venturi.

The auxiliary air valve in its downward movement causes the metering pin to go downward also and in proportion to valve movement. The air valve is integral with a piston which operates in a small housing. This piston prevents the air valve from fluttering.

To Reorganize Hans Motor Equipment
Reorganization of the Hans Motor Equipment Co., La Crosse, Wis., is as-

sured by an agreement entered into between Trustee D. G. MacMillan and P. M. Gelatt, and the preferred stockholders of the corporation. As a result of the agreement the preferred stockholders will retain their interest in the plant, without investing any additional money, and the factory will continue to operate, under the management of MacMillan and Gelatt. They have acquired the interests of J. H. Hans and Edmund Hans. Articles of incorporation of a new company are now being drafted.



In the new Schebler, the needle valve is opened by intercommunication with the auxiliary air valve, providing a properly proportioned mixture

Dealer's Legal Status

Though a Car Is Listed and Sold at a Certain Price This Does Not Oblige the Maker to Continue to Sell It at That Figure—He May Reduce the Price

By George F. Kaiser

I recently purchased a new 1915 model car from a local dealer, delivery to be made the following week. In the interim the manufacturer reduced the price of the car \$300, which naturally somewhat aggrieved me. Have I any redress, even though I signed a contract with the local agent? It has been suggested to me that I might start a civil suit and

claim that I asked the dealer at the time of sale whether he knew of any intention to reduce the price of the car, and that it would not be necessary for me to prove having asked this question because the burden of the proof—this being a civil action—would be on the defendant.

C. J. S.

Trenton, N. J.

The fact that a motor car has been listed and is sold at a certain price does not obligate the manufacturer or dealer to continue selling the car at that same price. A person always has the right to sell an article for as much as it will bring, and in the absence of any express contract, agreement or understanding, the same kind of an article may be sold to another person thereafter at a smaller price.

Of course, if the purchaser is induced to buy on the representation that a certain price will be maintained, another element is introduced into the case. The price reduction makes the car bought at the old price less valuable and a recovery of the reduced amount might be gained

on the ground of fraud or deceit. Cases brought on these grounds, however, are always very difficult to prove and a mere passing statement, not actually a cause inducing the purchaser to buy the car, would not be proper evidence.

The burden of proof in a civil action would be on the party bringing suit. He must make out a good cause of action on the evidence of his witnesses, or his case will be dismissed. The defendant need not produce any evidence if the party suing lacks sufficient evidence to constitute a good cause of action and may simply move to have the case dismissed and recover the costs of the action against the party who instituted suit.

Contract Hinges on Ability and Willingness Dealer Must Be Able and Willing to Deliver Cars to Subdealer to Prove Contract Was Broken

The Massachusetts Supreme Court recently said that the fact that an agent was at all times ready and willing to deliver the number of cars called for in his contract with a subdealer, must be shown by proper evidence before the subdealer can be presumed to have broken his contract in not purchasing that certain number of cars.

A subdealer started suit against a dealer to recover \$776.60. The dealer contended that there had been a breach of contract by the subdealer. The latter, however, succeeded in recovering judgment and the Massachusetts Supreme Court held that he was properly entitled to his judgment.

The subdealer had been engaged in business as an individual, but afterward incorporated. While doing business in-

dividually he made a contract, agreeing to purchase 25 cars, and made a deposit of \$50 on each car. The deposit was made and thereafter he incorporated and assigned all his rights under the contract to the corporation.

The court remarked that the subdealer could not be held to have broken his contract by assigning it in violation of one of its provisions, which provided that the contract should not be assigned without the other party's consent in writing, as that other party had waived this violation by continuing to do business with the corporation after it learned of the assignment.

The subdealer was allowed to introduce in evidence testimony to the effect that the dealer had sold 50 to 75 cars to other persons and a still larger num-

ber to a number of other subdealers.

The court held that this was good evidence, as it had a bearing on the dealer's ability to supply the subdealer with all the cars he had contracted for.

(Barker Auto Co. vs. Bennett, 106 N. E. 990.)

No Decisions Yet Under Indiana Garage Lien Law

Courts Have Not Yet Passed on Questions Under Measure Enacted in 1913

If possible we would be glad to have you cite us any decisions that have been rendered by Indiana courts covering the new Indiana lien law on the foreclosures of liens by garage and supply stores for the payment of bills due on automobiles for storage, repair work, gasoline, oil and supplies furnished.

Lafayette, Ind.

Columbia Tire & Auto Co.

It would seem that up to the present time there have been no decisions under the Automobile Lien Law, which was enacted at the 1913 session of the Indiana legislature, which provided for liens on automobiles for repairs and storage.

It will, of course, be merely a matter of time until the rights of dealers under this statute are passed upon by the Indiana courts. As soon as any reported cases come to our attention they will be published and discussed in this department.

Driver Responsible for Guest's Injuries

In Maryland recently a man sued a friend with whom he had been out motoring and recovered a judgment against him. While on the trip the owner drove negligently, smashing into a telephone pole and overturning the car. The guest suffered a broken arm and numerous sprains and bruises. When he brought suit, the court held that the suit was proper and rendered judgment in favor of plaintiff for \$1,750.

(Fitzgerald vs. Boyd, 91 Atlantic (New York) 547.)

Must Be On "Public Road"

Though a man may be arrested and charged with exceeding the speed limit in Texas, before he can be convicted it must be shown that he was speeding on a "public road." A motorist was arrested and convicted for exceeding a speed of 18 miles per hour. On his appeal, the court held that, as it was not proved the road he was driving on was a public highway, the conviction was improper. (Allen vs. State, 169 S. W. (Texas) 1151.)

Electric Building a Triangle of Efficiency

Combined Salesroom, Garage, Service Station and Offices

Simple System Keeps Rigid Check on Every Operation

AT the new Electric Building of the Electric Vehicle Association of America in New York, you may purchase any one of three makes of cars; you may garage your car, and have it properly cared for; and you may consult with officials of the Edison company, which furnishes most of the current that is used for lighting and power in the metropolis.

That, in brief, is the scope of this new and most modern Electric building. It is a combined garage for electric cars exclusively, an unusually attractive electric car market, and one of several headquarters of the Edison company. The Electric Vehicle Association of America, which is responsible for the innovation, has been working on the idea for some little time, and now that it has become a reality it well may serve as a model for other buildings of the kind.

Area 100 by 100 Feet

The structure that houses this triangle of efficiency is practically square, 100 feet on a side, and two floors in height; in addition, there is a roomy basement. The basement is used entirely for garage purposes except for a small space which serves for the heating apparatus and a room for the repair of batteries. The first floor is a combined garage and salesroom floor, each of the three salesrooms—Baker, Detroit and Rauch & Lang—

being 60 feet deep and connecting directly with the garage at the rear. The second and mezzanine floors are for garage purposes, with three stock rooms above the salesrooms.

Room for 100 Cars

All told, about 100 cars can be accommodated. The garage service consists of washing, cleaning, polishing, charging, mechanical and electrical inspection and delivery of the car, for which a charge of \$45 a month is made.

The building is of substantial construction and is lighted by the modern indirect system. The ceilings are white-washed and the light is reflected from them by inverted fixtures. The safety charging plug, Fig. 3, which is now required by law, is used exclusively; it consists of a ball and socket arrangement

by means of which a machine on charge may be driven away without damaging the plug or the charging wire, since the plug socket pulls in the direction of the motion and allows the plug to slip out. This is important, because disaster would be liable to follow breaking the wire of say, a 100-ampere circuit.

The charging equipment is most complete and consists of a large charging board located in the office and 48 charging plugs throughout the building, practically a plug for every two cars, which allows every car a 6-hour charge during the night.

Plugs from 25 to 100 Amperes

The plugs vary in capacity from 25 to 100 amperes. The smaller are for normal charging rates on small cars and the latter for boosting. There are two 100-



Key board for keeping track of call and delivery orders. Each owner has a square at the top and when an order comes in the key is placed on the proper square at the bottom

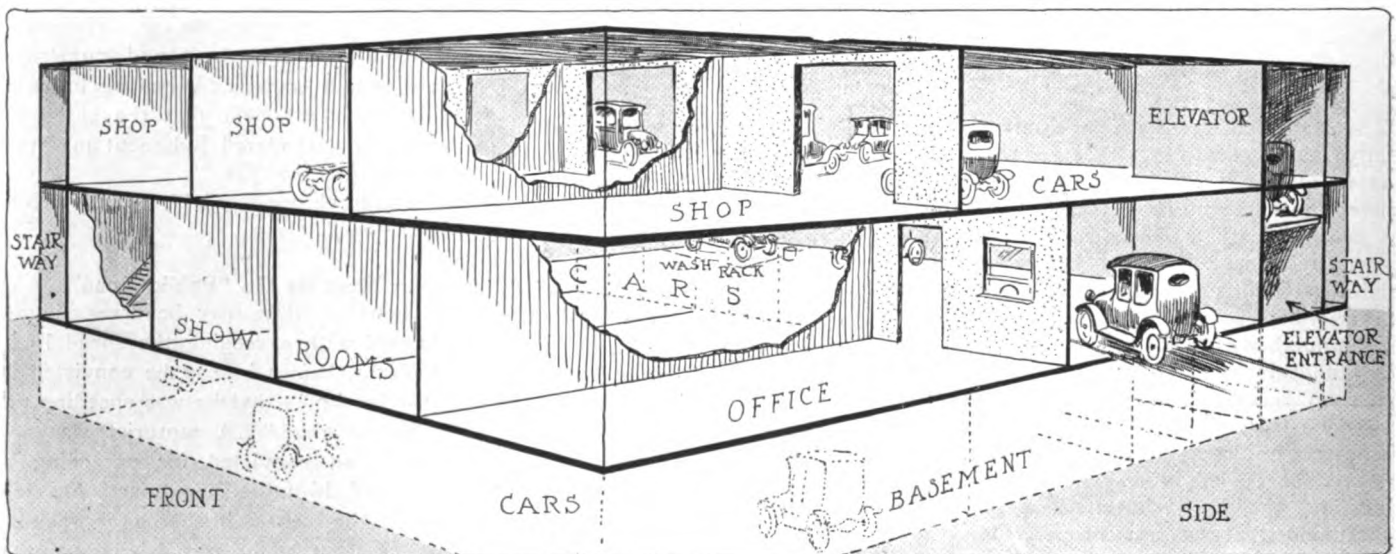


Fig. 1—Phantom view of new garage, showing disposition of space in two stories and basement. The three stores are at the left, the Edison company's office at the corner and the remainder of the space is given over to the garage storage. The elevator is at the extreme right. Over the stores are shops for the respective service departments

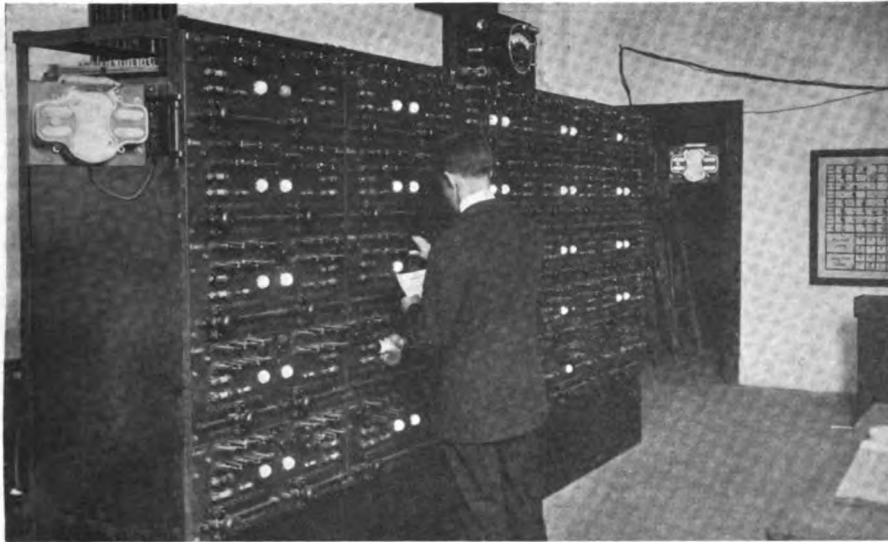


Fig. 2—Charging board located in Edison office. Each lamp bulb represents a charging plug in some part of the building. A combined volt and ammeter is placed at each end

ampere outlets, and these are situated at the entrance, where they are convenient for cars which require a short boost.

Back of these two plugs are four 50-ampere plugs, which are also large enough for ordinary boosting, if required. The remainder of the 50-ampere outlets, and there are 12, are situated in the basement near the center of the floor, the idea being to reduce the length of wiring on these high-capacity lines to a minimum so that the copper cost is lessened and also the resistance loss is cut down.

Charging Board in Office

The charging board, Fig. 2, is situated in the office, and has a separate panel for each of the 48 plugs. Thirty of the plugs are 25-ampere capacity, sixteen 50-ampere, and two 100-ampere. There is a voltmeter and ammeter at each end which will register the voltage or amperage supply to any battery. These two instruments are thrown into circuit by

moving the main switch. The construction of this switch is shown in Fig. 5, where it will be seen that by pulling it out, contact is made at the inner arms, and this diverts the current to the instruments.

The three-wire system is used, and therefore half the batteries must be con-

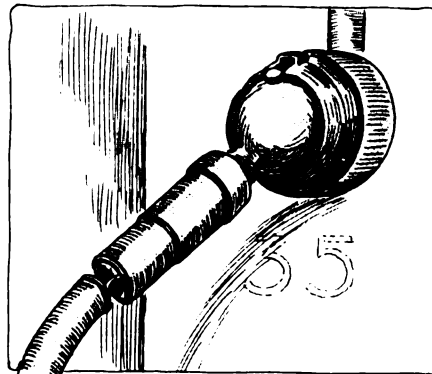


Fig. 3—Universal charging plug connection. Plug can be pulled out from any angle

nected between the positive wire and the neutral and the other half between the negative wire and the neutral. To readily accomplish this it is necessary to be able to place any battery on either

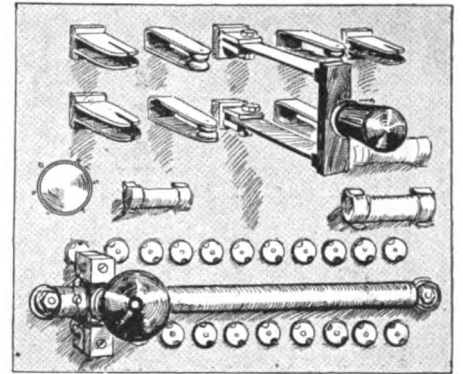


Fig. 5—One unit of charging board with double throw switch for balancing load on three-wire system. The small contacts are for ammeter and voltmeter readings. At the left is a lamp which lights when a battery plug is connected. Variation in charging is produced by the resistance which is controlled by the sliding switch at the bottom

side of the line at will and this is accomplished by means of a double throw switch, Fig. 5. With the switch contacts closed, on one side, connection is made with the positive side of the line, and on the other side, with the negative side of the line.

How well the current draw on the two sides is balanced is indicated by an ammeter at the center of the board. If for any reason the load becomes unbalanced to the extent of 200 amperes, a gong rings, a lamp lights and the circuit is automatically broken. As soon as a battery is connected, a lamp on the board lights.

Complete Record of Charge

A complete record is kept of the charging of each battery on a form, Fig.

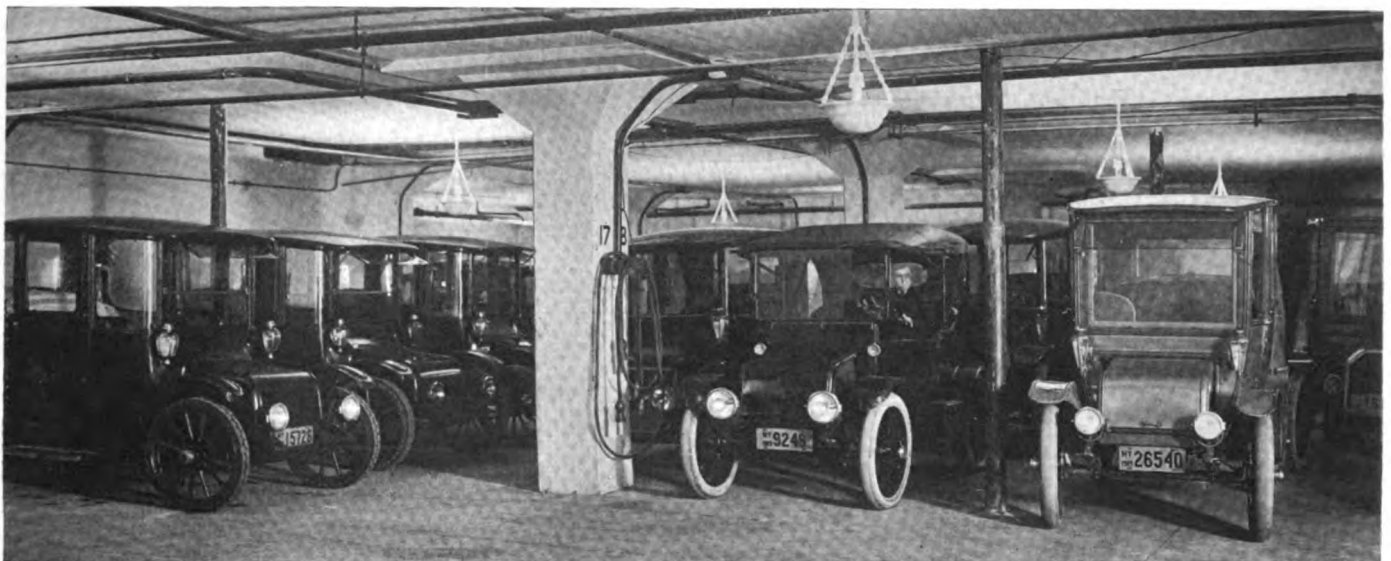


Fig. 4—One corner of garage, showing charging plug on post and indirect lighting system, a novelty in garage work. No attempt is made to put each car in the same place each night

who did it, and once a week a mechanical and electrical inspection is made and similarly recorded.

Should a chaser find something wrong with a car he makes out the card shown in Fig. 10, which gives the owner's name, address, registration number, who the car was received by, who inspected and repaired the car, and notes concerning what is wrong with the car are also made.

The complete garage force consists of three washers, three cleaners, one polisher, one battery man, two floor men, one charging board operator and one mechanic. The floor men work at night and spend their time arranging the cars compactly and moving them to and from the wash rack, etc. No attempt is made to place any car in any particular place, but they are stored as they come in.

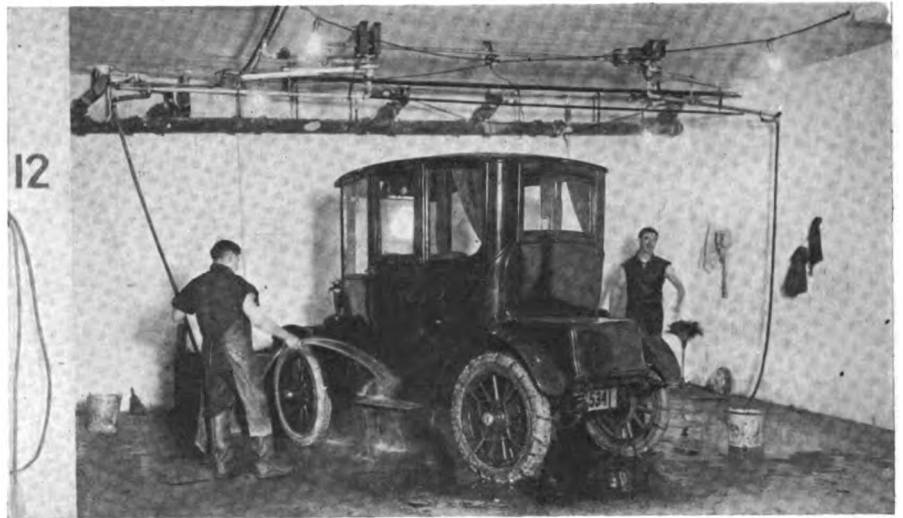


Fig. 11—One of the three wash stands; there is one on each floor. Pulling the hose turns the water on and releasing the hose turns the water off

Prosperity of Dealers and Manufacturers Linked Together

Dealer Who Appreciates a Good Agency and Sticks Can Make Money for Himself as Well as for His Manufacturer

The manufacturer of motor cars can never be more successful than his dealers. If his dealers are prosperous and making money, he will make money. If his dealers are losing money and salesmen are dissatisfied and disheartened, it is sure to reflect in the factory's financial and sales statement. It cannot be otherwise.

This fact is reckoned with more or less clearly. Where it is recognized dimly by the sales and manufacturing departments there is likely to be a continuous procession of dealers, handling the line from season to season. For unless the manufacturer perceives clearly that his own and his dealers' successes are one and the same thing, a dealer cannot afford to stick.

On the other hand, there are altogether too many dealers trying to be successful by resting entirely upon the reputation of the car they sell. In other words, they are allowing the factory to do most of the work. They get a good car, backed by good reputation and good advertising, and then support it by only mediocre effort.

A good car with this handicap can be moderately successful in any community. But the dealer should recognize that the agency for a good car is so important an asset that he is under moral obligation to the factory to back up the car with the best that is in him; the best possible service and the best possible selling force.

Where this is done and the business viewed, not as a one-year business but as a substantial and permanent business

in which one must move carefully and take as few chances as possible, success invariably follows. Look over the big dealers of the country, the dealers who have made big money and have it invested in good real estate, substantial buildings, etc., and you will observe that they are almost without exception men who have picked good lines of cars, worked hard at selling them and stuck to that line.

Consider the most successful retail salesmen in the industry and it will be observed that the men who have spe-

cialized on certain particular lines, instead of jumping after every will-o'-the-wisp, are the ones who have made the most money for themselves and their employers.

All of which suggests that the interests of the dealer and manufacturer are so nearly identical that it pays the manufacturer to select his dealers with care; and it also pays the dealer to select his manufacturer with care. Incidentally, the more this power of selection is deserved by manufacturer or dealer the more it actually exists.

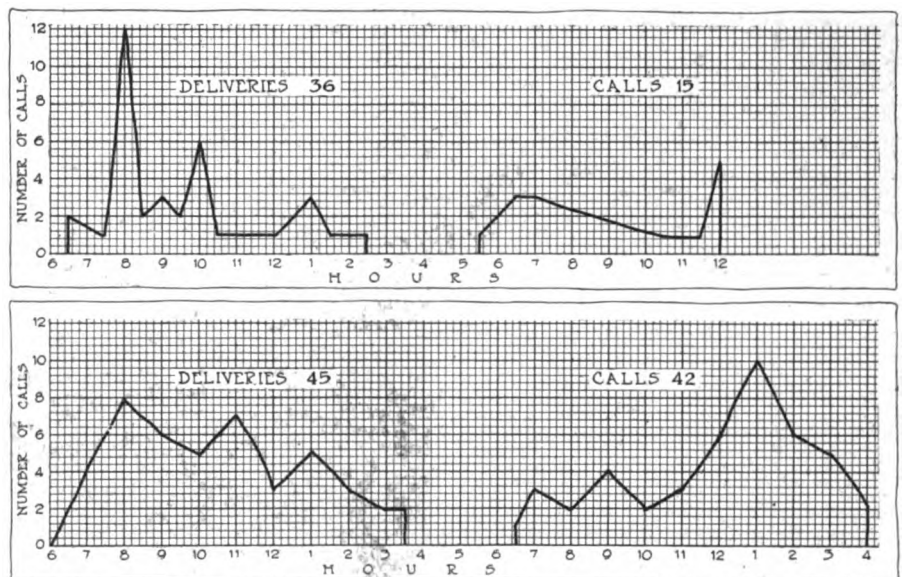


Fig. 12—Upper curves, showing number of cars called for and delivered each half hour throughout 24 hours. These curves show only the standing orders. Fig. 13—Lower—Similar curves for all the cars in the garage. The fact that there are fewer cars called for than delivered is due to some owners returning cars in person

WIDE-AWAKE MERCHANDISING

WHAT ABOUT THE PROSPECT LIST?

***Are You Following Up the List
Obtained at the Show?
Do It Now!***

What are you doing about the prospects whose names you secured at the show? Are you following them up? It seems perfectly ridiculous to ask such a question. Dealers go to shows and exhibit in order to get prospects. Why shouldn't they follow them up? Yes, why shouldn't they? That's the eternal question. Why pay for something and not use it?

And yet names are taken, fairly dragged out of the prospect at the show, and nothing ever happens. Often he never receives even a piece of literature to remind him that he talked with you at the show. Sometimes the salesman urges the person to just permit him to give a demonstration. "I just want you to ride in our car once; there's no obligation to buy; but I want you to have the sensation of riding in our Six," he says, and then he takes your name and for two weeks you look forward to having someone come around and give you a demonstration and nothing happens.

Time after time the MOTOR WORLD man has heard friends comment on this strange fact. And he has experienced it himself. That is why he says, "What are YOU doing about the prospects whose names you secured at the show?"

KNOW THOROUGHLY YOUR MERCHANDISE

***You Should Know Why Each
Part Is Used and Its
Advantages***

Above everything, the salesman should know every advantage or feature of his car. Not only should he know it by name, but he should understand and be able to explain the whys and the wherefores.

The simple statement that the car you sell has such-and-such a feature is not convincing. You may assume that the prospect knows far more about that particular feature than he really does.

In Kenosha, a dealer called on a prospect and after getting nicely started in conversation, the prospect turned to him and said: "I know your car by name and reputation. What is the particular advantage of your car?"

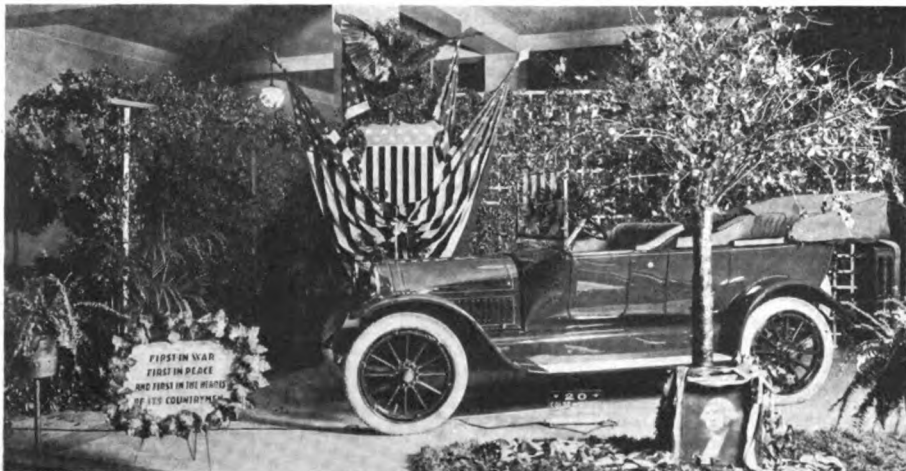
"Why, it's got Timken bearings," said the salesman—and that's as far as he got.

"What's the advantage of Timken bearings?" asked the prospect.

The salesman could not tell him. And he was not a new salesman, either.

This story seems impossible. But it's merit lies in the fact that it is the truth.

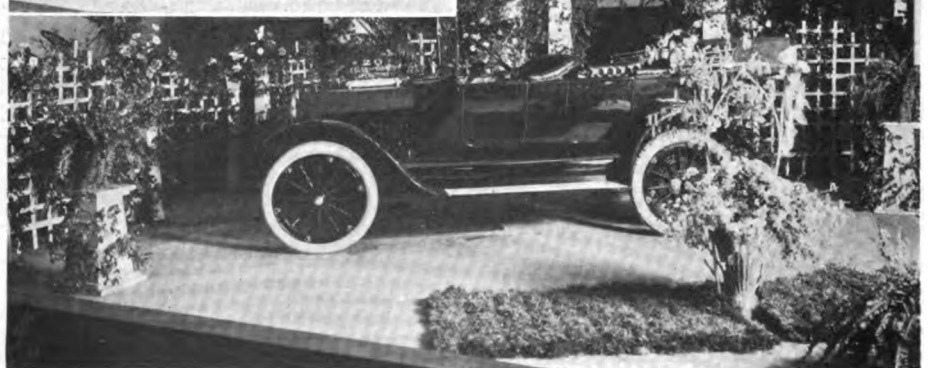
Well Decorated Salesrooms With a Mission

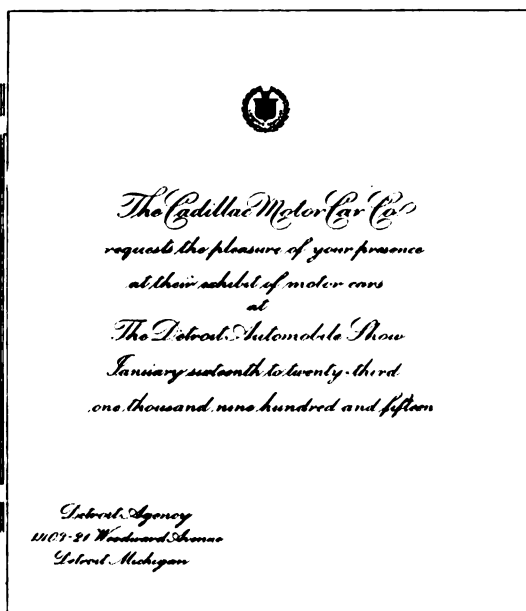


The Studebaker Corp., in its Detroit salesroom, inaugurated a window display campaign with a display built around the immortal Lincoln.

This Lincoln window was followed up by one in honor of Washington. The same background of smilax on a lattice arbor and pergola was used, and the opportunity to show a specially-painted car was taken. A cherry tree was constructed on a grass plot in the foreground, at the foot of which Washington's portrait was placed. Several flags were used both to decorate Washington's picture and to form the chief part of a patriotic standard which stood in the background. This standard also contained a large spreading American eagle and a shield of the United States.

Now an English garden with its roses and vines has taken the place of the patriotic decorations and the white latticed fence and gate reflect a great deal of work. White pedestals hold beautiful ferns and palms, and a basket of artificial flowers is placed in front of the car.





INVITATION TO YOUR LOCAL SHOW CAN BE MADE AN ATTRACTIVE PIECE OF WORK

Just what kind of an invitation to use for inviting customers and prospects to attend the local automobile show is a question that confronts every automobile dealer. And it is well worthy of careful consideration.

Here is a form of invitation used by the Detroit branch of the Cadillac Motor Car Co. with marked success. It is a handsome copper-plate job printed on good wedding stock with dignified wording that is certain to appeal to the class of prospects who buy Cadillac automobiles.

Enclosed with the invitation were two tickets, good for any night of the show. These were regular "Dealer" tickets, stamped with the signature of the Cadillac branch, to be charged to them if used. No restrictions were mentioned; and while the invitation specially invites attention to the exhibit of Cadillac cars, of course the recipient had access to the entire show.

Such an invitation, free from any urgent invitation to buy, has a style and a freedom that is certain to win the respect and confidence of the recipient.

Too Much Language and a Dearth of Facts Undoing of Salesmen

There is a Big Difference Between Getting a Customer for the House and Getting
an Order for Some Goods

"A salesman," says A. Auble, Jr., proprietor of the Akron Auto Garage Co., Akron, O., "is the hyphen which fills in the space between the word 'buy-product.' Most salesmen hold their jobs with diplomacy, without which they are not salesmen. Some salesmen rely on a quantity of talk, others rely on saying something with a brevity that is impressive.

"Too much language and a dearth of facts have been the undoing of many promising salesmen, and the 'Promising Salesman' is usually the one who gets the biggest bunch of promised orders. The man who is the most careful of his promises is the one who is on the payroll with the soundest grip.

"The salesman who does as he agrees, and is mighty careful while he is agreeing, is the one who is interviewed by the president the quickest—the one who doesn't is usually requested to report.

"Some salesmen sell goods; some dispose, and others get rid of them. There is a vast difference in the profit column of the three methods. Some salesmen spend so much time trying to get the prospect in the proper mood that they forget the real issue and fail to sell anything. He is like the man who waited an entire evening for theater time and then discovered that his watch had stopped. Some salesmen are good story tellers, others tell stories. There is a decided difference when quality is considered.

"There is only one person on earth who knows when a salesman is honest—

and that is the salesman himself—but in a reasonable length of time every one of his prospects has his measure in their mental notebook.

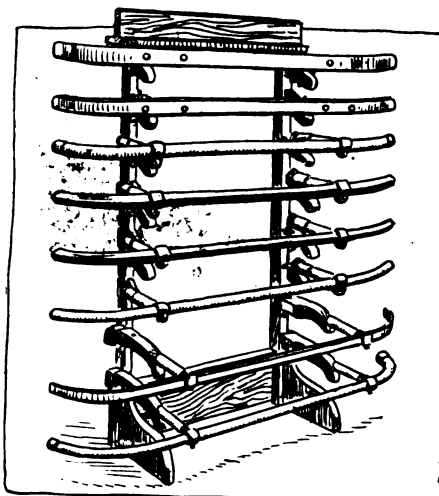
"So many salesmen try to find out whether they are holding a job or a position, and they wake up to find it is neither. Some salesmen can't define the difference between getting a customer for the house and getting an order for some goods. The right kind of a salesman gets both. Some salesmen have a ten-horsepower intellect and try to convert it into a ninety-horsepower pull for

business, with the result that their clutch slips on all the big deals that they tackle.

"The real salesman is he who can convert orders into customers for future orders, and like good farmers, use the same ground for a more profitable second crop. One who can sort out the customers from the prospects without wasting the valuable time of either; this kind is so scarce that they are seldom found outside of captivity, and you must usually make or have that kind made to your order."

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. One is illustrated herewith and this will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



The demand for bumpers is here NOW. This compact, hardwood bumper stand is furnished by the Emil Grossman Mfg. Co., Brooklyn, N. Y., and is an ornament as well as an excellent demonstrating "silent salesman."

It holds eight full size bumpers, for all popular makes of cars in several finishes. The stubs to which the bumpers are attached are patterned after the frame of the car to demonstrate that it is not necessary to drill the frame to apply the bumper. The dimensions of the stand are 71 x 65 x 25 inches. It is furnished free of charge with an order for eight standard bumpers and is shipped ready to set up.

Lathe, Drill and Milling Machine Combined in Compact Bench Tool

Small Work of Three Classes Can Be Done on Bench
Machinist—Will Cut Threads and Gears

A convenient little machine, that combines the functions of a lathe, drill-press and milling machine, is manufactured under the name Bench Machinist by the Hunt Engineering & Sales Agency, Los Angeles. While it is not claimed that the tool will do everything that can be done with three separate machines, it is capable of handling a great deal of small, light work and effecting economies of time and floor space.

The Bench Machinist consists of a bed, much like that of a small lathe, upon which slides a tool carriage, and a vertical column back of the bed carrying the driving shaft and a sliding head in which runs the working spindle. The head carrying the spindle can be swung in a circle so that the spindle can be set vertically for drilling and horizontally for milling and turning, as well as at any intermediate angle for angular work of any description.

Drive is through a three-step cone pulley mounted at the back of the vertical column, taking a flat 1-inch belt and a universally jointed and telescoping shaft to the head spindle; the spindle gear drives through a feather and spline, permitting longitudinal movement for drilling. The vertical travel of the head

on its column is about 6 inches and is controlled by a screw with a crank handle at the top of the column. When in vertical and horizontal positions the head is held exactly right by taper steel pins.

PRINCIPAL DIMENSIONS

Diameter of spindle.....	1 inch
Hole through spindle.....	$\frac{1}{2}$ inch
Diameter of face-plate....	5 inches
Length of bed.....	20 inches
Height of column over bed..	14 ins.
Maximum drilling capacity...	$\frac{1}{2}$ in.
Post takes lathe tools.....	$\frac{3}{8} \times \frac{1}{2}$
Table dimensions.....	6 x 9
Distance between centers...	12 ins.
Will cut threads.....	8 to 32
Diameter milling arbor....	$\frac{7}{8}$ inch
Net weight.....	125 pounds

The length of the bed is 20 inches and the table or tool carriage is 6 x 9 inches, the longer measurement being at right angles to the bed on which it slides. Longitudinal and cross feeds are operated by traverse screws, as in a lathe. On the carriage a revolving table is de-

tachably mounted with dividing head for milling work, and this can be used for cutting spur gears and, with an angle block, bevel gears also. A vise is supplied for holding plain milling work and is also useful for drilling. A detachable arm and a milling cutter arbor are included in the outfit.

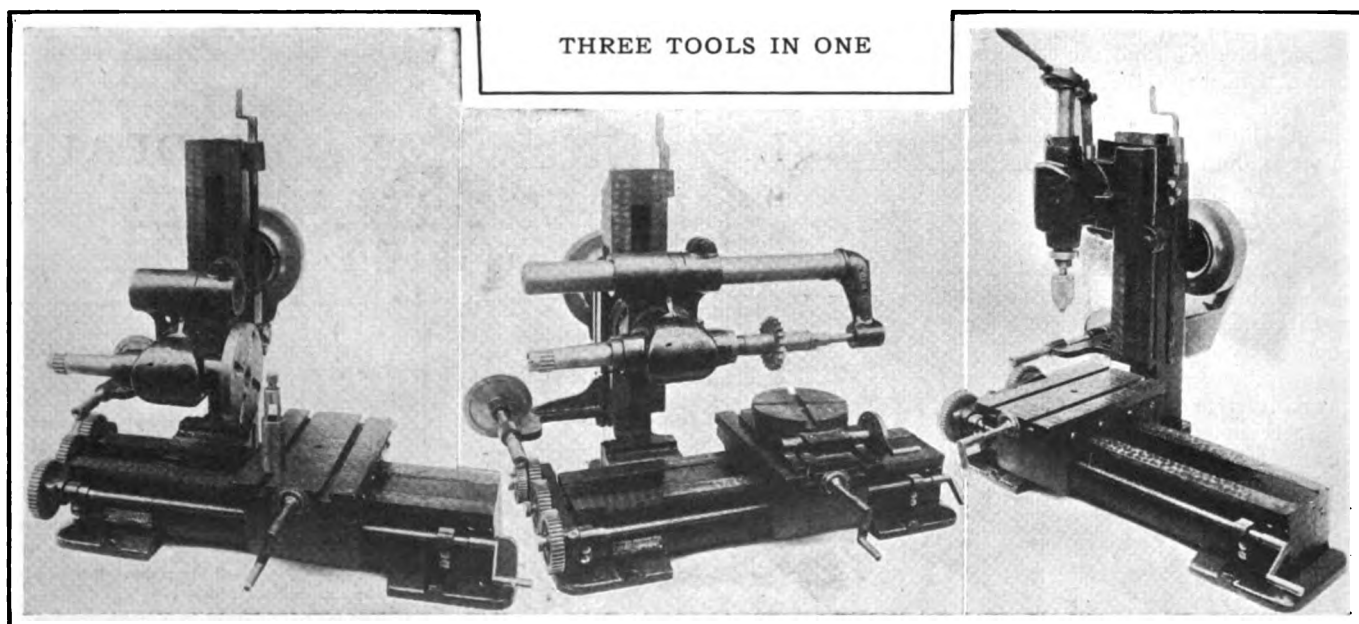
A set of change gears permits the varying of the longitudinal feed of the tool carriage so that screw-cutting can be done when the machine is used as a lathe. The change gears provide for cutting threads from 8 to 32, S. A. E. or U. S. standard optional.

Complete Machine Weighs 125 Lbs.

The principal dimensions of the machine are as follows: Diameter of spindle, 1 inch; hole in spindle, $\frac{1}{2}$ inch; working end reamed to Morse taper No. 2; diameter of face plate, 5 inches; length of bed, 20 inches; height of column over bed, 14 inches; maximum drilling capacity, $\frac{1}{2}$ inch; tool-post takes steel $\frac{3}{8} \times \frac{7}{8}$; tight-and-loose countershaft pulleys, 5 x $1\frac{1}{4}$ inches; speed of countershaft, 200 r. p. m.; net weight, without attachments, 125 pounds; shipping weight, 180 pounds.

For use as a drill press the head is set with the spindle vertical and the lever for applying pressure to the drill is attached at the top. A drill chuck is fitted into the Morse taper at the lower end. (The chuck is not included in the outfit.)

The work may be held in the milling vise or clamped to the table by means of T-bolts, according to its character, and any angle may be drilled by changing the position of the work or swinging the spindle head on the column. The vertical screw adjusts the drill to the



THREE TOOLS IN ONE

The Bench Machinist is not a big machine. A quarter-horsepower motor will drive it while milling, drilling and turning. Keyways and splines can be cut in long shafts

Set as a lathe for face-plate work. Longitudinal feed is by power

Arm and arbor in place for milling. Note rotating table for work

For drilling the spindle can be set vertical or at any angle

proper height to clear the job. When the work is clamped or fixed in the vise its position is accurately adjusted by means of the longitudinal and cross feed screws. Tapping can be done up to the capacity of the machine.

When the machine is used as a lathe, the spindle is swung into a horizontal position and the tool-post placed in one of the T-slots of the carriage. The 5-inch face plate fits on the spindle nose and the machine can be adjusted to take work of considerable diameter by raising the head on the column. Of course, heavy work cannot be done when the swing is large, but frequently a large piece requires work near the center, such as boring or facing or turning a boss, or only polishing may be required.

With this arrangement only face-plate or chuck work—work which does not require the support of a tail-stock center—can be done. Where a shaft or other long piece is to be handled the milling

arm is placed in position and a back center put in, which permits handling work up to 12 inches. For turning tapers the head can be adjusted to any angle on the column, and this can be done whether the milling arm and back center are in position or not.

For milling, the arm is placed in position and the cutter arbor and cutter inserted. The work may be held in the vise, clamped to the bare table by T-bolts or held on the revolving table, according to its size and shape. By swinging the arm, angular or vertical milling can be done. The open bed arrangement permits cutting keyways or squaring ends of long shafts without interference. Straight, taper or Woodruff keyways can be cut.

The longitudinal power feed for screw-cutting is obtained by swinging upward an arm at the left end of the bed carrying the change gears; the last gear meshes with a pinion cut in the end of

the spindle which, of course, must be in a horizontal position when this feed is used.

A special attachment is supplied at an extra cost for power longitudinal feed when the spindle is in other than horizontal positions; drive is then by belt from the cone pulley to a pulley on a short shaft carrying a worm meshing with a worm gear on the change-gear arm.

Milling cutters, drill chucks, drills, lathe tools, etc., are not included in the equipment, which does include, however, a countershaft with three-step cone and tight and loose pulleys, face-plate, tool-post, centers and screw-cutting gears for lathe work, and plain vise, revolving table with dividing head, arm and arbor for milling. T-head clamping bolts and tool-post wrench are also supplied. The machine in all cases is designed to stand on the bench. The power required to drive it is $\frac{1}{4}$ horsepower.

Carleton Dynamo Has Porcupine Drive

Will Charge Storage Batteries of Small Cars, Is of Light Weight and Inexpensive

A small generator that can be applied to Ford cars without machine work of any kind, using special bolts in holes already drilled in the motor, and which will furnish a current of 7 amperes at 7 volts when running at its normal speed of 1,800 r. p. m., is manufactured by the Carleton Co., Boston, Mass.

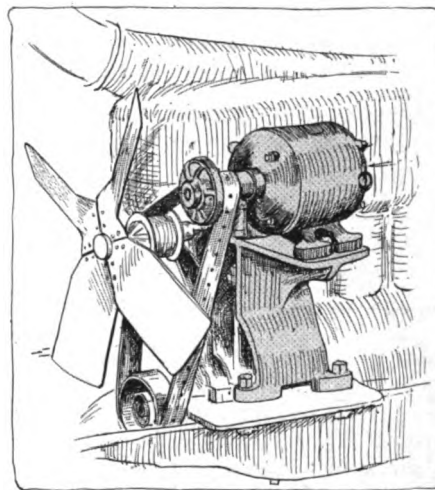
The generator is mounted at the front of the engine with its driving pulley in line with the fan pulleys; a special belt runs over both fan pulleys and the generator pulley, forming a triangular drive. The generator pulley is fitted with radially projecting spines, from which the name porcupine drive is derived; this device makes practicable the use of a much smaller pulley than would otherwise be possible. Either plain or ball bearings are fitted.

The dimensions of the generator are: Length, 6 inches; diameter of case, 4 inches; total height, 5 inches; total shaft length, 7 inches; diameter of shaft, $\frac{3}{8}$ inch; weight, $9\frac{1}{2}$ pounds. The case, which is die-cast, completely encloses all parts and is finished in black enamel.

Sufficient current is generated to charge an ordinary 6-volt battery or to light lamps requiring a maximum current of not more than 49 watts. As the current consumption of the usual tungsten bulbs is 1 watt per candlepower for headlights and $1\frac{1}{4}$ watts per candlepower for side and tail lights, it is a simple matter to figure what combinations of lamps

can be used satisfactorily with the generator.

A mechanical governor on the end of the shaft at the pulley end prevents damage to the windings by excessive



Carleton generator on Ford car. Porcupine spines on small pulley make belt drive positive and permit high ratio. Current is regulated by an automatic governor

generation of current when the engine is raced. It is enclosed and runs on ball bearings; an outside adjusting nut regulates the output from one ampere to full capacity, regardless of engine speed.

Instead of the mechanical governor, a combined electrical governor and cut-

out is furnished if desired. This acts on the field coils, regulating the output by varying the field strength. It is mounted on the dashboard of the car under the hood. The electrical governor can be used only with the ball-bearing generator.

An automatic cut-out also is supplied; this performs the usual function of cutting out the connection between generator and battery when the former is stopped or is running so slowly that the battery might be discharged through it. Like the governor, the cut-out is mounted on the engine side of the dashboard. It has double contacts of carbon and bronze and is enclosed in a tight stamped steel case which fastens to the fiber base with a bayonet lock.

The prices of the various items, which may be purchased separately or in sets, are as follows: Generator with plain bearings, \$15; with ball bearings, \$17.50. Mechanical governor with porcupine pulley, \$6.25. Combination electrical regulator and cut-out, \$8. Electrical cut-out, \$4. Bracket for Ford, Saxon or Metz, \$2.50. Leather belt, \$1.25. The items comprising the regular Ford set are the generator with porcupine pulley and mechanical governor, bracket, belt, automatic cut-out and 6-volt 60-ampere battery, the price of the latter being \$15. Larger 6-volt batteries also can be supplied at \$20 for 80 amperes and \$25 for 100 amperes.

Vulcan Insurance Lowers Rates

Reduced rates on motor car insurance have been promulgated by the Vulcan Insurance Co., New York city, applying to cars under \$1,500. Policies including theft and valuation clauses now carry a rate of $1\frac{1}{2}$ per cent for new cars instead of $1\frac{3}{4}$; for last year's cars under \$1,500 list the rate has been cut from $2\frac{3}{4}$ to $2\frac{1}{4}$.

Advanced Maintenance

ALUMINUM SOLDERING PROBLEMS

By George Fernwell



NO data of a positive nature are available as to the exact nature of the injurious or weakening action of tin or solder partly composed of tin.

According to one authority assumed to have investigated the subject, the destructive action of tin on a "soldered" joint in aluminum apparently consists of a "slow diffusion of the tin in the solid state resulting in the forming of a layer of a very brittle alloy of aluminum and tin so that the joint breaks. This is a slow action and may require a year for its completion." The authority quoted is Professor O. B. Watts of the University of Wisconsin.

Electrical Action Weakens

Soldered Aluminum Joints

It seems well established that owing to aluminum being electro-positive to all other metals that the presence of any other metal or alloy, such as would be used as solder in the joint, results in the setting up of an electrolytic action which causes a disintegration or rotting of the metal in and adjacent to the joint.

At the present day this seems an apparently insurmountable obstacle to the devising of an unqualifiedly successful aluminum "solder." In addition to the above reason affecting the durability of a soldered joint, there are other obstacles to success in uniting aluminum.

One of these is that aluminum is such a free conductor of heat that in soldering by any process which is similar to ordinary soldering in the heat required, especially when repairing a crack in a large casting such as a crankcase, the heat applied with the equivalent to a soldering iron is rapidly dissipated through the mass of the casting.

New Film of Oxid Forms

Almost Instantaneously

Another and still greater difficulty is that a cleaned surface of aluminum when heated becomes coated with an exceedingly thin film which is supposed to be oxidation. If this film is scraped off during the process of soldering, a new film quickly forms. Even with the most effective fluxes so far devised the film is very troublesome.

Methods have been devised of successfully uniting aluminum by pressing two

heated aluminum surfaces together with considerable force and without the use of "solder" or welding metal.

While successful under ideal conditions such processes have apparently little practical range of application to the needs of the repair-shop. One such method consists of first polishing the surfaces to be joined as at the end of two

Aluminum Soldering Facts

Tin in solder alloys with aluminum and forms brittle joint

Soldering iron good only for small aluminum soldered repairs

Aluminum carries off heat faster than the iron supplies it

Oxid forms almost as fast as the surface can be cleaned

Combined pressure and heat are sometimes used for joints

Complex processes are not adapted to ordinary repair shop use

In the Poland system, surfaces are coated before oxid can form

Special solder is made of tin, spelter, aluminum and phosphor tin

Steel scraper is used on hot surface while solder is flowing

Parts to be joined are clamped together while solder hardens

bars of aluminum, possibly shaping the ends after the manner of a smith's cleft weld, then arranging the bars in such a manner that pressure can be applied with a screw or a clamp so as to practically force the surfaces in contact to amalgamate.

The ends to be joined in this process are heated with a reducing flame; that is, a flame which causes little or no oxidation, to about 400 deg. Centigrade. They are then pressed together as stated and subjected to a thorough hammering while the flame continually plays on the joint to maintain the required temperature.

Another method of welding by pressure, devised by Cowper-Coles, involves

a specially designed machine in which the bars are held with the surfaces to be joined in close contact until the latter are heated to a melted but not a flowing state. The machine then provides a convenient and effective means of forcibly pressing the united ends together until they actually swell out to a larger mass or bulb-like formation.

Soldered Joints Satisfactory

For Temporary Repair Work

In processes of uniting aluminum such as those described above, difficulties are met with in keeping the flame so that it does not oxidize the aluminum and that it maintains the necessary degree of heat.

In other methods devised by practical investigators for uniting aluminum under pressure without solder or weld metal, a flux is used to aid in overcoming the trouble of oxidation.

Notwithstanding the fact that a "soldered" joint in aluminum may be expected to break down in use sooner or later, the requirements of automobile work are occasionally that the repair will serve its desired purpose if it holds together for a short time; that is, until the part can be more permanently repaired by welding or until an entire new part can be obtained to replace the one temporarily repaired.

Process Which Combines

Soldering and Pressure

Under such circumstances, and within limits, the more favorably known aluminum solders may be used, or possibly even more favorable results may be obtained with a method for which the writer was indebted to C. H. Poland in the Brass World, although owing to the above-described limitations of aluminum solders no extensive use has been made of it by the writer other than for emergency purposes. This purpose might be described as a combination of a soldered joint and a joint obtained by pressure.

In devising this method it was realized that the temperature used in soldering with an equivalent to a soldering iron is ineffective owing to the rapidity with which the comparatively small supply of heat from the soldering iron would be conducted away from the joint through the mass of aluminum.

Therefore, this method is carried out with similar equipment to that used for brazing, with a fairly powerful blow-pipe flame to maintain sufficient heat.

The "solder" used in this process is composed of tin, 2 lbs.; spelter, 8 oz.; aluminum, 1 oz.; phosphor tin, 1 oz.

To make this "solder," first melt the spelter and aluminum in a crucible, then add the tin and thoroughly stir and mix it before finally adding the phosphor-tin. Pour the molten metal in scrupulously clean moulds or on an inclined and warmed slab so as to form long thin wires or strips.

An essential part of this process is that a means be devised of being able to apply considerable pressure with a screw or clamp in order to force the heated surfaces into the closest possible union.

The need for clamping the surfaces also limits the range of repair work to which this process can be applied. Obviously it would be useless to attempt to repair a crack in the oil chamber of a crankcase by this means if the crack were located along the sides or body.

On the other hand, the process might serve effectively for a temporary repair of a broken lug or bracket or other ex-

tension from the main body of the crankcase casting. As in this case it would be usually possible to devise a means of clamping the work before repairing and

FORMULA FOR ALUMINUM SOLDER

Metal	Ounces
Tin	32
Spelter	8
Aluminum	1
Phosphor tin	1

1. Melt spelter and aluminum in crucible.
2. Add tin and stir thoroughly.
3. Add phosphor tin.
4. Pour into clean moulds or on warmed slab.

of increasing the clamping pressure after the work was brought to the proper heat.

In the case of such a repair as the latter, prepare for clamping and clean the broken surfaces until bright.

Then, one at a time, heat each surface with a blow-pipe flame, applying "solder" until some melts onto the surface.

This solder will not flow in a liquid as ordinary solder or brazing spelted does, but will at first apparently refuse to adhere to the aluminum surfaces. Instead, the solder will form little lumps on the surface of the aluminum.

While keeping the work hot with the blow-pipe flame, and using a steel scraper with a rather long metal handle, rapidly and thoroughly scrape the entire heated surface, including the sharp corners at the extreme edges. At the same time, move the melted lumps of special "solder" so that they follow and surround the cutting edge of the scraper.

The idea here is that immediately a portion of the surface is scraped clean from oxidation, the solder is right on the spot ready to unite with the surface.

When by this process of scraping solder has been permitted to adhere to the surface all over, the excess solder may be wiped off when there should remain a thin film of the solder thoroughly coating and adhering to the surface.

When satisfied that this preliminary coating is properly applied to each of the two surfaces to be joined, the parts may be clamped together with sufficient force to hold them in alignment and contact.

Need Simple Tools for Brake Lining

Extreme Skill Not Essential to Producing a Good Job, But Work Must Be Done Carefully

Brake relining is a simple operation and one that consumes little time if the proper method is used, but if the work is not done according to this method a large amount of time may be lost and a poorer job will result.

The tools required to do the job correctly include a hammer and cold chisel, which are used to cut away the old rivets, a drill and counter bore, a drill press, a rivet set, and three clamps.

After the bands have been removed from the car and the worn linings removed, the first step is to cut the new lining to the correct length; its width should be slightly wider than the band. The lining is then fastened in place with three small clamps, and the rivet holes drilled through it. The drill must be slightly smaller than the holes in the band so that it will not bind. This work should be done on a drill press and the band can be held in the hands.

These holes must be counter-bored so that the rivets will not come in contact with the brake bands when replaced on the car. Generally the counter-boring is carried to two-thirds the thickness of the lining, so that the rivet heads do not touch the brake drums until but one-third of the lining remains.

The counter-boring is done with a tool

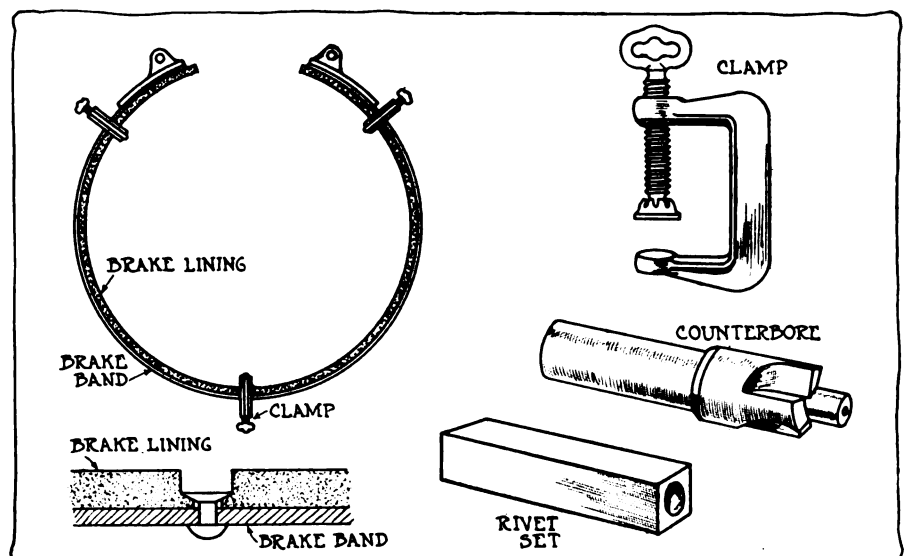
designed for this purpose, called a counter-bore, and purchasable at most supply stores. It differs from a twist drill in that it produces a hole with a flat bottom in which the rivet fits snugly.

In order that speed may be obtained in doing this work, it is desirable to limit the downward movement of the spindle

of the drill press so that when the tool has bored two-thirds the way through it will stop. This may be done by moving the table of the drill down so low that the extreme travel of the spindle will only allow the hole to be counter-sunk two-thirds of the way; another way is to put a stop collar on the spindle.

The rivets should be large enough to comfortably fill the holes in the brake band, and the counter-bore should be little larger than the rivet head, which means that different counter-sinking tools should be used for different rivet head sizes.

Finally the heads of the rivets are turned over by means of the rivet set.



The new lining is attached to the band by three clamps and drilled and counterbored. The rivet is sunk well below the surface and the outside head afterward formed with the set

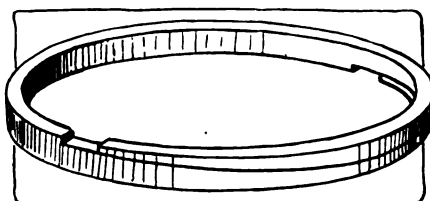
RECENT DEVELOPMENTS in ACCESSORIES

Inland One-Piece Piston Ring

The Inland piston ring, manufactured by the Inland Machine Works, St. Louis, Mo., is of fine-grained cast iron in a single piece, finished all over and concentric. Its peculiarity is that the joint, which is a tapered lap, extends for half the circumference of the ring; that is, the joint ends at a point diametrically opposite to the point where it begins. The ends are quite thin—less than half the thickness of the ring radially. Part of the process of manufacture is a heat treatment which is designed to bring the ring into normal condition when exposed to the working temperature of the motor. The long joint gives flexibility and permits the ring to hug the cylinder walls closely under all conditions.

All regular sizes are made. The list

prices are \$1 each from 2½ to 3¾ inches diameter; \$1.20 for 4 to 4¾ inches diameter, and \$1.50 from 5 to 7½ inches



The long lapped joint of the Inland piston ring extends for half the circumference of the ring. The ring is concentric and is machined inside and out

diameter. These are regularly made 3/16 to 5/16 wide; 3/8- and ½-inch widths are made at an advance in price of 25 per cent.

will easily go into the vest pocket; full cable temples are fitted, and the sides are of leather, thoroughly ventilated. Price, with seal grain leather case, \$2. A special model is made to suit the requirements of ladies and children at the same price.

The New Willson goggle is framed entirely in metal which, being rust-proof, may be sterilized. The bridge is adjustable and the sides are of fine-mesh wire gauze; temples are half-cable. The weight does not rest on the nose but is distributed over the face and temples, making the goggles easy to wear. They may be put over ordinary spectacles or glasses.

A new line has recently been placed on the market consisting of goggles with rims of Zylbex, or imitation tortoise shell. All have cable temples.

Dealers' price on the night and day goggle, including case, is \$16 per dozen; Willson goggle, round or oval, \$8 per dozen; Albex folding goggle, \$13.50 per dozen.

GOOD THINGS IN GOGGLES AND EYE-SHIELDS

Ample Protection and Lightness Features of New Types

Willson

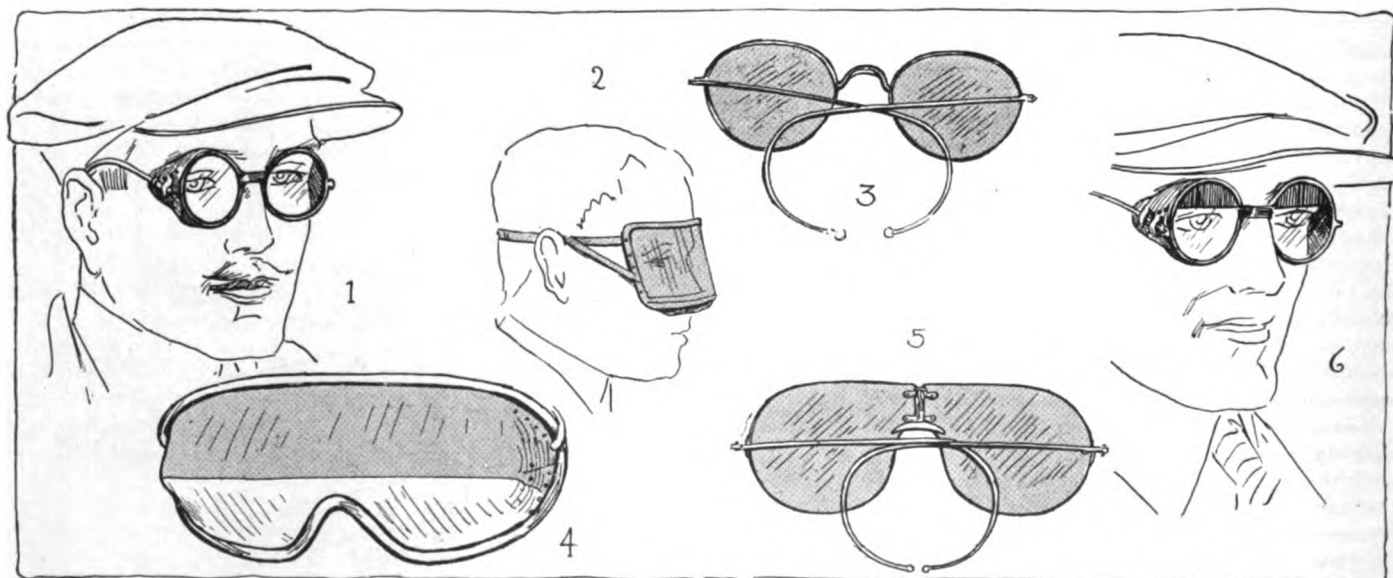
Goggles for all purposes are manufactured by T. A. Willson & Co., Reading, Pa. Among the more popular styles are the night and day, Albex and New Willson. The night and day goggle is fitted with lenses having light amber glass in the main portions, and in the upper part a section of dark amber, so that by tipping the head forward the wearer can look through the top sections, which are

sufficiently dark to make vision easy in the face of the glare of an approaching headlight. The bridge is of soft silk, the sides of pliable leather, well ventilated, and the temples full cable. Price, in leather case, \$2.50.

Albex goggles have large round lenses of flat glass and may be had in amber, flouzal, smoke and amethyst. The bridge is of silk and the goggle folds and slips into a small case that

Luxfel

The Globe Optical Co., Boston, Mass., manufactures the Luxfel goggles, in which a special tinted glass is used. Two new models have been developed, No. 251 and No. 252, both of the spectacle type; frames are gold-filled, lenses large and of the toric shape. Guards are easily adjusted. No. 251 has a special spring bridge and long, drop-shaped lenses; No. 252 has a rigid bridge and lenses that



Half a dozen varieties of goggles. (1) Albex self-adjusting. (2) Leasure eye and nose shield. (3) Autocrat eye guards. (4) Fulton-McCutchan dimmer goggles. (5) Autocrat frameless. (6) Willson night-and-day goggles

are not quite so wide but a little deeper. Price, in substantial spring case, \$5 per pair.

Leasure

A shield that protects the nose as well as the eyes, is made of flexible transparent material instead of glass, and that may be rolled and put in a small case, is manufactured by the Leasure Eye and Nose Shield Co. and sold by the Sanitary Sales Company, Inc., Pittsburgh, Pa.

The transparent sheet extends across the upper part of the face in a single piece; it may be had in white, amber, blue or green. A thin gauze at the bottom goes under the nostrils and protects them from dust. The shield can be worn over ordinary glasses or spectacles and is light, weighing half an ounce. The price is \$1; dealers, \$6 per dozen.

Autocrat

The entire field of goggles is covered by the line manufactured by the American Thermo-Ware Co., Inc., New York city.

The readiest sellers in this line are in the types known as open-air eye guards, which are merely spectacles designed for protection of the eyes from wind and dust and have no side guards. Model 322 has curved amber lenses $2\frac{1}{2} \times 2$ inches and gold filled frame, cable temples, hoop bridge and strengthening brace on top of frame. Price, \$4; with special white metal non-rusting frame, \$2.25.

The Autocrat frameless has lenses of amber glass, curved to conform to the shape of the eye and brought together at the top and fastened with a neat metal device. They may be had with or without rims. Nose piece may be bent in or out to suit the wearer. Temples are of the cable type. The price is \$5 per pair.

Dimmer Goggles

Dimmer goggles and eye-shields are sold by the Fulton-McCutchan Co., Chicago, in two types. Both are made of a transparent composition called pyralin, instead of glass. The dimmer goggle is made of a single piece of pyralin with the lower part clear and the upper part colored, so that by tipping the head forward the eyes are protected. The binding may be either of silk or soft rubber, the latter making it possible to wash the whole goggle. The head band is of soft rubber cord and may be passed around the head or looped over the ears. Several choices of colors are given—clear with green shade, dark amber with green shade, light amber with orange shade, or clear with orange shade.

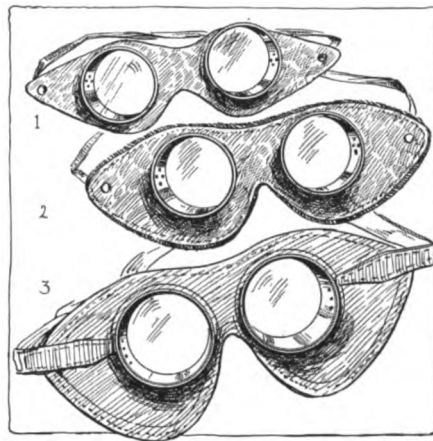
Price, regular size, 75 cents; extra large size, which may be worn over glasses, \$1. Leather case, 25 cents. Sin-

gle color type, clear, light amber, dark amber or green, 50 and 75 cents.

The eye shield is made of a single piece of pyralin without binding and is practically invisible at a short distance when made of clear pyralin. Light or dark amber can also be supplied. Price, with pyralin case, 25 cents.

Stoco

Goggles in several styles are manufactured by the Standard Optical Co., Geneva, N. Y., including a new series in which the lenses, though each of one piece of glass, are amber colored in the upper half and white below. A special manufacturing process is employed to avoid the use of two pieces of glass for each lens.



Three Stoco goggles. Upper, dust goggle; middle, Berkshire model; lower, large slip-overs

Among the most popular of the Stoco goggles are the Dust, Stormer, Berkshire and Slip-over models.

All these models are made with flaring nickel eye-pieces, carrying the circular lenses and leather masks. The smallest is the dust goggle, which has $1\frac{3}{8}$ -inch lenses, which may be of clear glass, blue, green, amber or smoked. Stormer goggles are made in the same way but are larger in every way, having $2\frac{1}{16}$ -inch lenses and more ample mask; they may be worn over ordinary glasses. Berkshire goggles have $1\frac{7}{8}$ -inch lenses and velvet-bound leather masks. The Slip-over is a large goggle with $2\frac{1}{6}$ -inch lenses and a wide mask of fine quality of leather, tooled and stitched, and wide adjustable bands. Choice of colors may be had in any of these goggles, and aluminum eye-pieces are furnished at a slight advance in cost.

Anti-Rattler for Ford Brake Rods

A special hardened steel bolt, with nut, cotter-pin and lock washers, to replace the regular Ford brake-rod clevis pin when it becomes worn, is supplied by the Auto Parts Co., Providence, R. I. The bolt is put in place and the nut tightened sufficiently to take up lost motion; when

worn, the nut is taken up a little more. Price, 10 cents each; dealers, 25 per cent.

Fritz Two-Jet Carbureter

The principle around which is built the Fritz carbureter, manufactured by the Fritz Carbureter Co., Norristown, Pa., is the control of the fuel feed by and in proportion to the air drawn through the instrument. The float chamber is annular with the main fuel jet in a chamber in the center of it. All air enters at the intake D; there are two ways, however, for air to reach the outlet to the manifold, which is directly over the main jet.

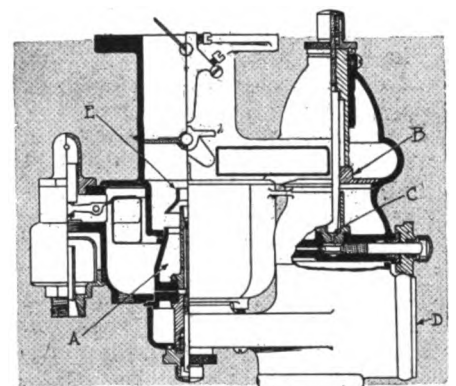
The air inlet is in an offset part of the carbureter and directly over it is the second fuel nozzle, which is the high-speed nozzle. Directly in line with the intake is a passage leading to the choke air tube in which is the main nozzle. The second air passage leads past the high-speed nozzle in the offset part of the carbureter and enters the body of the carbureter at a point just below the throttle.

An automatic air valve is located above the high-speed nozzle; its lift is proportionate to the speed of the engine and as it lifts it opens the needle valve in the high-speed nozzle. The air passing through the choke tube A is concentrated around the main nozzle by a shroud or petticoat E.

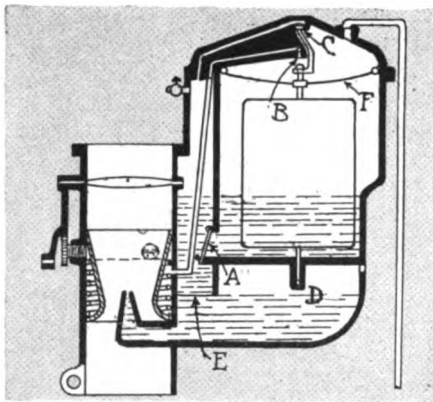
At low speeds the main jet furnishes all the fuel; as the speed increases the high-speed jet is opened by the lifting of its valve and more fuel is injected into the main stream. Adjustments are provided so that both fuel supplies can be regulated to a nicety.

For easy starting there is a special supplementary throttle above the main throttle. When this is closed a direct passage to the float chamber is opened, permitting the drawing in of a very rich mixture. Once the motor is started the supplementary throttle is opened wide and thereafter the main throttle only is used.

Four sizes are made— $1\frac{1}{4}$ -inch, \$25;



Two separate jets located in different air passages are employed in the Fritz carbureter. There is but one air intake. The jet C is the high-speed jet and is idle at low speeds; the main jet is under the petticoat E



In the Vacuum carburetor a vacuum feed is used instead of the usual float feed system, the suction in the intake pipe being utilized

1½-inch, \$35; 1¾-inch, \$40, and 2-inch, \$45. These prices do not include hot air attachments, which are \$2.50 each all sizes. Hot air attachment includes three feet of flexible tubing; extra tubing can be had at an extra charge.

Lined Brake Shoes for Fords

A special Ford brake shoe, complete with asbestos lining, is supplied by the Auto Parts Co., Providence, R. I., ready for attachment. The band is of malleable iron, the lining is said to be good for about 2,500 miles in a hilly country and can be renewed at a cost of 25 cents, which is the price charged for renewals by the manufacturer; this includes rivets. Price, with springs, \$1 per pair; dealers, 25 per cent.

Vacuum Self-feeding Carburetor

A carburetor to which fuel is fed by vacuum and in which the gasoline in the nozzle is maintained at the proper height without the use of a float in the constant level chamber, is manufactured by the Vacuum Carburetor Co., Detroit. The accompanying drawing shows diagrammatically the method of operation, but no attempt is made to show the actual construction accurately.

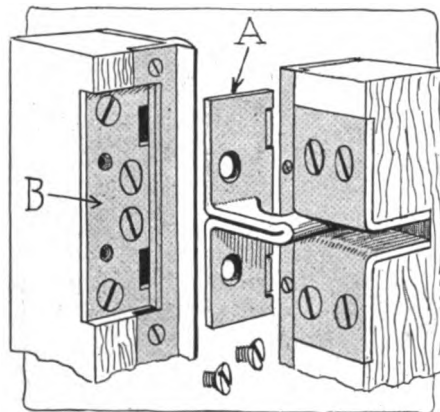
A single nozzle opens into a venturi, which is held in normal position by a spring and rises under the suction of the motor, thus automatically varying the suction on the fuel. There is no automatic air valve and the only adjustment is on the spring governing the movement of the venturi. The usual butterfly throttle is placed in the mixing chamber above the venturi.

The venturi is a short tube of smaller diameter at the middle than at the ends, and its effect is to greatly increase the suction on the fuel when the spray nozzle is located at the proper point with relation to the neck or smallest part. The moving venturi varies the relative positions of the nozzle and the neck and so varies the degree of suction on the fuel.

The vacuum chamber, into which fuel is delivered direct from the tank, is above

the constant level chamber and is connected with the tank by a pipe and with the intake manifold by a small tube opening into the chamber at B. Vacuum causes gasoline to flow into the chamber until the float accumulates sufficient energy, through buoyancy, to overcome the resistance of the spring F, when the passage is closed by the valve at B and at the same time the valve at C opens a passage leading to a second and smaller chamber by means of a check valve, A. With equalized vacuum in both chambers the check valve opens and allows fuel to flow from the larger to the smaller, until the level is equalized.

Gasoline flows down through the passage E to the constant level chamber D until it reaches the level of the orifice, when further flow is stopped until the level drops and permits air to pass up and an equal volume of gasoline to come



A door hung on Anchor hinges can be detached by removing two small machine screws from each hinge and slipping lugs out of slotted plates

down. The opening is of a special shape so that the level in the nozzle is unaffected by tilting.

When sufficient fuel has been used to permit the weight of the float to snap the spring F down again, the vacuum line again is formed to the chamber and more fuel is drawn in, and simultaneously the small feed chamber is isolated by the closing of its valve C and of the check valve, which is kept closed by the vacuum. The cycle is then carried through as before and is continued as long as fuel is used.

The carburetor is made in four sizes—1-inch, 1¼-inch, 1½-inch and 2-inch.

Anchor Detachable Concealed Hinge

A door hinge which permits doors to be removed for painting, trimming or other work without detaching hinge-plates from either pillar or door-stile, is manufactured by the Metal Specialties Mfg. Co., Chicago.

The construction and installation of the hinge are shown clearly in the accompanying illustration—in fact, the illustration requires little assistance in that respect further than the explanation that the main part of the hinge is attached to

the body pillar; a plate, B, attached to the door-stile is slotted to receive two lugs formed integral with the hinge member A, and also is drilled and tapped for two machine screws. This makes a simple and substantial means of attachment and permits easy removal.

The hinge is designed to permit the application of paneling without difficulty or interference, and without making an unsightly finish. Once the hinge is set there is no reason, ordinarily, for its removal. The material used in its manufacture is hot-rolled pickled steel.

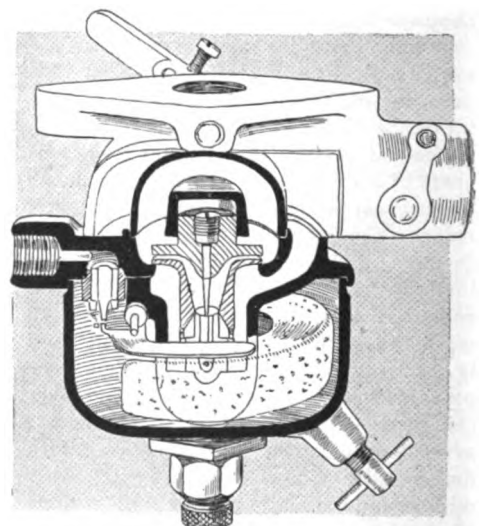
The price is 25 cents per hinge; dealers, 33⅓ per cent.

Shakespeare Springless Carburetor

The outstanding feature of the carburetor manufactured by the Wm. Shakespeare, Jr., Co., Kalamazoo, Mich., is that it is springless, the opening of the needle valve being affected by suction working against a disk attached to the valve stem. The valve is shown in the position it takes when inactive.

The float chamber is of the concentric type and the air intake is at one side; air flows under the mixing chamber and part of it enters at the base of the venturi, passing close to the fuel nozzle and forming a very rich mixture because of the small volume of air. As the suction increases the valve is lifted further from its seat, permitting the passage of more air and at the same time opening the needle valve and allowing a freer flow of gasoline. At full throttle there is a great deal of air which does not pass through the venturi, but which mixes with the rich gas from the venturi in the proper proportion to form a mixture of maximum efficiency. The rich mixture emerges from the venturi at right angles to the column of air, so that there is an intimate mechanical mixture.

Four sizes are made, as follows: ¾-inch, \$12; 1-inch, \$15; 1¼-inch, \$16.50, and 1½-inch, \$19.50. Dash control, \$1.50.



No springs are employed in the construction of the Shakespeare carburetor. Both air and gasoline valves are automatically controlled by suction

MOTOR WORLD

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Jitneys and Used Cars

IT has been said that it is an ill wind that blows nobody good, and though there may be none but the traction companies to style the jitney movement, which every day is gaining in strength, an ill wind, it seems certain that this same wind, good or ill, is going to blow the used car dealers some good.

In Kansas City, the jitney buses are carrying 45,000 passengers a day—or they were a few weeks ago, and likely this number has been increased within the past fortnight. It is also a significant fact that the majority of these 45,000 passengers are carried not in buses proper, taking the term in its generally understood meaning, which is a vehicle for carrying from a dozen to a score of passengers, but by touring cars.

Buses Not Always Best

For short distances, up to 2½ miles, even the limited experience that is available would seem to make plain that the touring car is the more efficient vehicle of the two for the purpose. For longer distances it is practically agreed that the bus proper is more efficient. And inasmuch as there are comparatively few jitney routes which really may be placed in the long-distance class, it follows that there exists now a demand for used touring cars which likely will increase in proportion as the jitney movement swings over the country.

Already some dealers in used cars are taking advantage of this demand. In at least one case a Western dealer has been advertising extensively in the daily papers for jitney-operator purchasers. Furthermore, he has made it easy for the man of more than slender means to purchase his used cars by offering

to accept payment for them on the installment plan out of the earnings of the buses themselves.

Whether this practice is to be recommended is open to question, though there can be no doubt but that this jitney bus fever represents a very real opportunity for the live used car dealer to dispose of his stock. Here is an outlet that will absorb a great number of used cars; the market requires little cultivation; it is there, waiting. And it is the dealer who realizes this fact and takes advantage of this opportunity who will have the smallest stock of used cars on hand at the end of the season.

Policy Wording Important

INSURANCE in almost any one of its many ramifications is, and always has been, more or less of a mystery to the average man in the street. Actually, however, there is little reason why this should be so. Perhaps it is because the average policy is printed in type so fine that it is an effort to wade through it.

That there is need of much enlightenment almost daily is brought home to some dealer, garageman or repair-shop operator who has been "too busy" to study out the wording of his policies. It is too late after the horse has been stolen to lock the barn doors.

Insurance policies are a series of clauses which may or may not be abstruse to other than the insurance man. These clauses all have a definite meaning, from which there is no departing. It is essential that the policy holder be fully aware of EVERY clause in his policy in order that he may know exactly how fully he is protected. There may be clauses in the policy of which the holder knows nothing; and again there may be one or more clauses left out which are of vital importance and the holder may be ignorant of their omission until he enters claim.

Know Every Clause

One of the most important clauses contained in most policies is the one governing the issuance of additional insurance. Many dealers do not know, for example, that there is such a clause which expressly prohibits them, on pain of making void the existing policy, from taking additional insurance. Generally, this provision is overcome by the addition of a rider on the policy which gives the holder permission to secure and carry other insurance. But it is important that this appear on all policies.

Another important feature with which the dealer should be familiar is the amount of alteration that may be made under the policy, and what may be done under its provisions in the way of temporary or permanent installation of new fixtures.

With all these points in order, and a thorough understanding of them in the mind of the policy holder, there is one other point which is of even greater importance than all the others together. It is: "Are the companies with which you are doing business thoroughly responsible financially?"

Dealer Supply House

The RETAIL NEWS



Garage Repair Shop

C. C. Leader and **W. D. Sharpe**, forming the Puget Sound Motor Car Co., with headquarters at 907 East Pike street, Seattle, Wash., have contracted for the distribution of the Reo in the territory embracing all the counties from the northern boundary of Pierce county to the British Columbia line.

W. E. Cleveland, owner of the Oneida Boat Co., manufacturing boats and engines, Rhinelander, Wis., is about to erect a large shop addition for garage and repair-shop purposes. The paint shop will be doubled in size to accommodate boat painting in summer and motor car body refinishing in winter.

The Jacksonville Automobile Co., conducted for several years by **L. F. O'Donnell**, was purchased last week by **S. W. Braner** and **A. H. Jensen**. The latter firm has been conducting a garage upon a small scale and felt the need of enlarged quarters. The company is located in Jacksonville, Ill.

David Ellis, of Dodgeville, Wis., and **P. O. Vivian**, of Mineral Point, Wis., have formed a partnership and will engage in the garage business April 1. The former Stratman vehicle works has been leased and is now being converted into a garage and repair-shop.

John Gaarden, formerly of Spring Valley, Wis., has returned from California after a long stay and leased the Ellsworth Auto Co.'s garage. The garage is being overhauled and remodeled and will be opened April 1. Gaarden will handle the Studebaker and Dodge.

Schmit Bros., operating a garage and the Ford agency at Port Washington, Wis., and **Fredonia**, Wis., have established a third garage at Belgium, Wis. The firm has purchased the Krier property and will remodel it for garage and repair-shop purposes.

Patrick Chantelois, **P. O. Lund** and **Max Happle**, of Iron River, Wis., have formed a partnership under the style City Garage and on April 1 will open a garage and repair-shop on Main street. A livery will be operated in connection with the business.

The Chicago Automobile Supply House, 1355 Michigan boulevard, Chicago, has found it necessary, on account of business growth, to take larger quarters and will straightway occupy the en-

tire premises at Nos. 1349-51-53 Michigan boulevard.

The Oneida Garage Co., Rhinelander, Wis., owned by **William Gilligan, Jr.**, and **C. J. Wesley**, has purchased the building adjoining the present quarters and will double the floor space. The concern represents the Overland and Ford.

The Auto Transit Co., Frankford, Pa., has purchased a plot of ground 60 x 150 on Frankford avenue, north of Dyre street, and will erect a modern garage. The company also will operate a motor bus line between Frankford and Langhorne.

The Advance Sales Co., which recently opened for business at 864 Woodward avenue, Detroit, is handling accessories. This company was formed by **W. F. Nick** and **J. J. Grady**, both formerly connected with the Maxwell Motor Co.

W. K. Cowan, Southern California's pioneer automobile dealer, has again entered the trade. Cowan has closed with **Earle C. Anthony, Inc.**, to represent the Grant line in Pasadena, Altadena and Eagle Rock.

Martin Bros., who started a small repair-shop at Endeavor, Wis., last summer, are making plans for the erection of a modern garage building and will buy a complete new outfit of tools and machinery.

Walter R. Bamford has been appointed distributor for the State of Michigan by the Monarch Motor Car Co. and will have his temporary headquarters at the factory, Walker and Woodbridge streets, Detroit.

Clifford Smith has disposed of a half interest in his garage at Fort Atkinson, Wis., to **Claire Roberts**. The new firm intends to erect a new garage of fireproof construction, with a large repair-shop.

Orren Smart and **E. H. Philipps**, Waukesha, Wis., have purchased the University Garage on University avenue at Madison. Both were for several years in the garage business at Waukesha.

The Delevan Lake Boat & Engine Co., Delevan, Wis., which established a garage a year ago, will build a 50 x 60-foot addition in the spring for live storage and repair-shop enlargement.

I. N. Simpson, who recently was appointed state distributor for Wisconsin of Dayton Airless tires, has established

a store and service station at 290-292 5th street, Milwaukee.

Philip Slocum, operating a garage and agency at Oshkosh, Wis., has filed a voluntary petition in bankruptcy, scheduling his liabilities at \$1,156, all unsecured, and his assets at \$69.50.

The Whitaker-Seeley Sales Co. has been formed in Indianapolis to represent the Metz car in that city. Headquarters have been established at 425 North Meriden street.

Larkins & Co., of San Francisco, one of the pioneer automobile firms of the city, celebrated its golden jubilee during the past week, having been 50 years in business.

Anton Zahorik, of Milwaukee, is about to establish a garage and repair-shop at Carlton, Kewaunee county, Wis. A modern fireproof building is now being erected.

O. I. Riddle and **H. E. Strohecker** have formed a partnership and will build a garage in East Palestine, O. They will handle the Grant car.

The Auto Surplus Stock Syndicate is now located at 1657 Broadway, New York, and not at 1675, as inadvertently was stated last week.

The Fairmount Garage Co., Fairmount, W. Va., has commenced construction of a new garage measuring 65 x 42, two stories in height.

H. A. Mitchell, who was chief engineer of the Krit Motor Car Co., has opened a service station at 940 Jefferson avenue, East, in Detroit.

H. F. Hansen will open a garage and repair-shop at Hartland, Wis., on April 1, with **Laurenz Jensen** as superintendent.

Joseph Mazer, **William Fisher** and **Harvey M. Aronson** have organized the William Penn Garage Co. in Pittsburgh.

Brown & Garthwaite, operating a garage at Bloomington, Wis., have dissolved partnership.

Leon Herpick has bought one-half interest in the Star Garage of **F. L. Betts**, of Union City, Pa.

Charles Vaughan is about to establish a livery and taxicab line at Marshfield, Va.

Allen Spang has opened the first garage in Livingston, Wis.

Car Components for Spain

Manager **Vallet** of the Hispano-Suiza Fabrica de Automobiles, Barcelona, Spain, is in America on business and is temporarily located in the office of **A. Caragol**, 127 Water street, New York city. He is interested in the purchase

of chassis forgings, rear axles, front axles, springs, steel for gears, wire wheels, steering rods with ball sockets, brake drums, radiators, steel stampings, leather for upholstery purposes, paints and varnishes, chrome steel, nickel steel and accessories.

Association of Ohio Garagemen

An association of Ohio garagemen will be formed at a convention which will be held in Columbus, June 19. **E. C. Shockey**, Judicial building, Columbus, Ohio, holds the position of provisional secretary.

USED CAR REPORT NOW IN NATIONALIZED FORM

**Covers Seven of the Zones Into Which
United States Is Divided—Tells
How Many Sales Make
Average**

The Used Car Central Market Report of the Chicago Automobile Trade Association has made its appearance in nationalized form; the data covers seven of the twelve zones into which the United States has been divided and it is hoped within the next three months to have the figures in hand for statistics covering the remaining divisions.

The manner in which the report is compiled is shown in an accompanying illustration of part of a page; the page arrangement is considerably different from that of the original Chicago report. Across the top are the headings of the zone columns, beneath which are the names of the central cities in each zone. The "As Is," "Partial Overhauled," "Rebuilt" and "As Is Appraised" nomenclature is retained and means the same as in the old reports.

The prices in the case of actual sales are the averages of all the sales of a particular model in the zone in question; at the extreme right is the average price for the whole United States. To show the number of sales upon which the average is based for the whole United States certain letters, placed after the price, indicate the number of sales; they are: a, 5 and under; n, 6 to 10; u, 11 to 15; v, 16 to 20; g, 21 to 25; x, over 25. The present number includes more than 3,000 used car sales, made during the last three months of 1914.

In the case of 1914 cars no appraisal value is given; it was found upon investigation that less than 2 per cent of the 1914 cars were sold as used during the third quarter of 1914, so that an appraisal on this basis would not have been fair. Dealers are advised to make such sales on the customer's account or consider each car on its own merits, disregarding any fixed valuation.

No appraisal is made on enclosed bodies because of the great variety of style and price.

Subscriptions to the list are \$24 a year—for four issues—but in clubs of 12 or more, through manufacturers' organizations or otherwise, a price of \$12 is made; manufacturers who have subscribed for 12 or more are: Chalmers, Franklin, Packard, Pierce-Arrow, White and Winton.

Dealer associations may secure the club rate, and where a club subscription has been sent in, additional copies may be secured at the club rate.

The latest list covers 131 makes of

gasoline pleasure cars and 14 electrics. Associations which are cooperating are: Electric Automobile Manufacturers Association, Columbus Automobile Trades Association, Milwaukee Automobile Dealers Association, Motor Car Dealers Association of Rockford, Ill., Motor Car Dealers Association of Los Angeles, New Jersey Automobile Trade Association, Kansas City Motor Car Dealers Association, Buffalo Automobile Dealers Association, Colorado Automobile Trade Association, Philadelphia Automobile Dealers Association, New Haven Automobile Dealers Association, Baltimore Automobile Dealers Association, Automobile Dealers Association of New York City, Fort Dodge Automobile Dealers Association, Portland Automobile Trade Association, Worcester Automobile Dealers Association and Boston Automobile Dealers Association.

Standard Steel Car Eight at \$1,735

The Standard Steel Car Co., Pittsburgh, Pa., is about to market an eight-cylinder seven-passenger touring car which will sell for \$1,735. It will have a unit power plant of the accepted V type with cylinders measuring 3 x 5. The wheelbase will be 121 inches. It will also bring out a six with 4 x 5½, T-head motor, cast in threes at \$2,100, with five-passenger body only. Both cars are equipped with vacuum fuel feed. The eight motor is a Herschell-Spillman.

Cutting & Smith Get Van Speedometer

The Cutting & Smith Sales Co., Detroit, hereafter will handle the Van Sicklen speedometer for the states of Michigan, Ohio and Indiana.

Chicago Office for Adams-Bagnall

The Adams-Bagnall Electric Co., Cleveland, O., has opened an office at 417 South Dearborn street, Chicago. It is in charge of Van N. Marker.

Although it was reported last week that Guy Lewin had received the London, England, agency for Dodge Bros. cars, the statement is an error. No such arrangement has been consummated.

PROMINENT MEN OF TRADE WHO ASSUME NEW DUTIES

**Resignations and Promotions That Serve
to Place Many Workers in New
Places—Few of Them Leave
the Industry**

R. H. Spear has been appointed general manager of the Scripps-Booth Co., Detroit. Spear is author of the Commercial World Encyclopedia of Accounting, a work on factory costs and accounting, which is one of sixteen business books he has published. Latterly he has been general manager of one of Detroit's Hygeia ice plants.

George P. Hewitt, Appleton, Wis., a pioneer motor car dealer of Wisconsin and state distributor of the Buick in Wisconsin until the establishment of a direct factory branch by the Flint company, has been appointed manager of sales of the Four Wheel Drive Automobile Co., Clintonville, Wis.

William A. Schendel, assistant purchasing agent of the A. O. Smith Co., Milwaukee, has resigned to accept the post of purchasing agent for the A. J. Lindemann-Hoverson Co., Milwaukee, a large sheet metal working interest.

John L. Utermoehl, for many years secretary of the LaCrosse Board of Trade and more recently secretary of the Hans Motor Equipment Co., LaCrosse, Wis., has resigned to become general agent for the Wisconsin Life Insurance Co., of Madison, Wis., for the western district of Wisconsin.

A. Morehouse has resigned as assistant chief engineer of the Hudson Motor Car Co., Detroit.

William E. Metzger has been elected president of the Auto Parts Mfg. Co., Detroit. A. O. Dunk, who was president of that company and also of the Puritan Machine Co., will devote all his attention to the latter concern.

T. C. Woodwin has been appointed district sales manager for the states of Kansas, Missouri and Nebraska by the

USED CAR CENTRAL MARKET REPORT													
BUICK—Continued.													
Model	Year	Type	Pass. Capac.	Cyl.	H. P.	List Price	1	2	3	Zone Numbers	7	10	United States Average
27.	1911	Tour.	5	4	25	\$1150	Boston	N.Y.	Phila.	Cleveland	Balto.	Chgo.	E.C. Average
							As Is	Partial Ovbl.	Rebuilt	350			350a
28	1913	Tour. Acet. S.	5	4	25	1050	As Is	Partial Ovbl.	Rebuilt	475	425	350	418a
							As Is	Partial Ovbl.	Rebuilt	300			500a
30	1913	Rds. E.-L. & Acet. S.	2	4	30	1125	As Is	Partial Ovbl.	Rebuilt	400	325	515	483u
							As Is	Partial Ovbl.	Rebuilt	519			518a
31	1913	Tour. E.-L. & Acet. S.	5	4	25	1285	As Is	Partial Ovbl.	Rebuilt	487	607	700	560u
							As Is	Partial Ovbl.	Rebuilt	525		500	513a

Section of a page from the Used Car Central Market Report in its nationalized form

Lewis Spring & Axle Co., Jackson. He will make his headquarters in Kansas City.

A. M. Potter has been appointed manager of claims of the service department of Dodge Bros., Detroit. Formerly he was manager of the service department of the Lozier Motor Co.

William L. Burgess, formerly manager of the rim department of the Firestone Tire & Rubber Co., Akron, and latterly sales manager of the Enger Motor Car Co., Cincinnati, has become affiliated with the Dorris Motor Car Co., St. Louis. He will have entire supervision over sales.

J. H. Armstrong, who was in charge of the Detroit office of S. F. Bowser & Co., has joined the Cutting & Smith Sales Co., Van Sicklen speedometer distributor.

Carlton R. Mabley has become affiliated with the sales organization of the SKF Ball Bearing Co., New York. Mabley is well known to the trade as a member of the old firm of Smith & Mabley, which introduced the Simplex car some 10 or more years ago. Subsequently he served for a term with the Fiat company, and for the past five years has been general manager of the R. I. V. Co.

A. S. Holly, for several years with Alvan T. Fuller as manager of the truck department of the Boston Packard agency, has severed his connection with that company to assume the management of the J. C. Tucker Co., distributor for Chase trucks in that territory. B. E. Blackley will manage the Tucker agency in Providence, R. I.

Owen Joins Forces With Houpt

Ray M. Owen, one of the pioneer sales organizers in the automobile industry, has joined forces with Harry S. Houpt through the purchase of a substantial interest in Harry S. Houpt, Inc., eastern distributor for the Mitchell car. In addition, the Owen magnetic car now will be marketed. While the Owen magnetic car will be handled independently in New York city, both cars will be marketed together at other points.

Protest Increased Tire Rating Plan

Efforts of the railroads to increase from third class to second class the rating on pneumatic tires in carloads is meeting with protest on behalf of the automobile manufacturers through the National Automobile Chamber of Commerce. Following the horizontal increase of 5 per cent in the rates applicable to these shipments, it is felt that any additional increase would be unfair, especially in view of the decreased value of tires as compared with the conditions when the third class rating was fixed. The increase from third class to second class would mean a substantial increase in the charges for carrying tires.

GARAGE LIEN BILLS PUT FORWARD BY GARAGEMEN

New York and Michigan Tradesmen Foster Legislation Aimed at "Dead Beats"—New York Directors Meet

The Lien bill of the United Garage Associations of New York State, which is one of that new organization's first works, has been introduced in the New York legislature; it is drawn as an added section of the existing lien law and is 186A. It will give the garageman a lien on cars even after they have left his possession.

The association is also fathering a measure designed to permit the sale of gasoline, tires and supplies on Sunday; this is not now permitted in the Sunday closing law, and while the matter never has been made troublesome the legislation is sought as a measure of precaution. The new lien clause follows:

Liens for the repairing, storing, et cetera, of motor vehicles. On complying with the provisions of this section, the proprietor of an automobile garage shall have a lien on each motor vehicle as defined by the highway law, which he shall store or upon which he shall make repairs, or alterations, or for which he shall furnish accessories, gasoline or other supplies, either at the request or with the consent of the owner of such motor vehicle, whether such owner be a conditional vendee or a mortgagor remaining in possession or otherwise, for the amount agreed upon, or, if no agreement is made, for the amount specified in the statement hereinafter required to be filed, if, within ninety days after the storing, altering, repairing, furnishing accessories or supplies for such motor vehicle, he files a notice of such lien in the same manner and place as chattel mortgages are required to be filed. Such notice of lien shall be in writing, specifying the person against whom the claim is made, the consideration thereof, the amount of the same, and a description of the property upon which the lien is claimed and shall be verified by the oath of the lienor. Such lien shall terminate at the end of eighteen months after the date of such filing, unless, within that time, an action is commenced for the enforcement thereof as provided in sections two hundred and six to two hundred and ten, both inclusive, of this chapter, for the foreclosure of a lien on chattels.

This act shall take effect immediately.

The board of directors of the association met last Wednesday in Albany and formally entered upon its duties; one man had heretofore done practically all of the work. The executive committee was empowered to perform the duties of the board of directors as a matter of business facility. The committee is investigating an insurance proposition wherein nine present policies are combined in one. It also decided to use the Dougherty Detective Agency, of New York, when such services are needed.

Michigan's Bill

The garage lien law movement, which had its origin in Illinois and which is designed to give the garagemen a lien

on the customer's car even after it has left the garage, has taken root in Michigan under the tutelage of the Detroit Garage and Station Operators' Association; this law is aimed at the "dead beat." L. C. Steers, chairman of the legislative committee, is conducting a propaganda among Michigan garagemen, asking them to get behind the bill. The bill follows:

AN ACT to establish, protect and enforce by lien the rights of garage keepers who furnish labor or material for storing, repairing, maintaining, keeping or otherwise supplying automobiles or other motor propelled vehicles.

Section 1. That every garage keeper who shall in pursuance of any contract, expressed or implied, written or unwritten, furnish any labor, material or supplies, shall have a lien upon any automobile or other motor propelled vehicles, stored, maintained, supplied or repaired by him for the proper charges due for the storage, maintenance, keeping and repair thereof and for gasoline, electric current or other accessories and supplies furnished, or expenses bestowed or labor performed thereon at the request or with the consent of the owner or the person having the possession thereof, whether such person be a conditional vendee, or the mortgagor remaining in possession, or otherwise, and such garage keeper may detain such automobile or other motor propelled vehicle at any time it may be in his possession, or repossess such automobile or other propelled vehicle, wherever it may be found, if out of his possession, and detain said automobile or other motor propelled vehicle until such proper charges are fully paid.

Section 2. If such charges are not paid within ninety days after due notice to the registered owner of the license plates of said automobiles or other motor propelled vehicles, said garage keeper may advertise and sell said automobile or other motor propelled vehicle at public auction, in the same manner and after the same notice required in sales of property seized on chattel mortgage, to the highest bidder to satisfy said claim, and the garage keeper may bid on the vehicle so offered for sale. Any surplus received at said sale shall, after all charges of said garage keeper have been paid and satisfied and all costs of sale have been deducted, be returned to the owner of said automobile or other motor propelled vehicle.

Section 3. The person in possession of any automobile or other motor propelled vehicle which has been sold and not re-registered in the office of the Secretary of State in compliance with law shall, so far as relates to liability for the storage, maintenance, keeping or repair thereof, or for supplies, accessories, electric current, or labor performed, or for expenses bestowed thereon, shall be considered to be the owner of such automobile or other motor propelled vehicle and no prior owner shall be relieved of liabilities for storage, maintenance, keeping and repairs, or supplies, gasoline or labor, until he shall have removed the number plates issued by the Secretary of State to him and shall have made the Secretary of State the statement provided by law to be made in case of sale of automobile by other than manufacturer and dealer.

Section 4. Wherever, in this Act, is used the term "garage keeper," it shall be construed to include all persons who for hire or reward publicly offer to store, maintain, keep and repair automobiles and other motor propelled vehicles and to furnish accessories and supplies for automobiles or other motor propelled vehicles for the transportation of persons or merchandise upon and over the public streets and highways; provided, that in municipalities wherein are in force any laws or ordinances relative to the regulation and licensing of garages, no person shall be entitled to avail himself of the provisions of this Act unless he shall, during the period of the whole time covered by his claim for lien, have been duly licensed and shall have fully complied with all laws and ordinances relative to the licensing of garages.

Autocar Reduces Price \$200

Due principally to a considerable increase in the volume of its business, the Autocar Co., Ardmore, Pa., has reduced the price of its standard chassis \$200. The new price is \$1,650.

Minneapolis Speeders to Lose Cars

Minneapolis motorists who violate the traffic or automobile laws after March 21 will be deprived of the use of their cars for a full year, according to an edict issued by Police Judge Smith last week.

"PAY CASH" CONSIDERED BY MILWAUKEE DEALERS

Plan Is Suggested at a Meeting and Association at Once Takes Action—Has Full List of Committees

Putting business on a cash basis is one of the problems which has been attacked by the Wisconsin Automobile Business Association, Milwaukee, Wis. The subject came up at a recent meeting and such sentiment developed that the association instructed the Credit Committee to investigate further and report on the feasibility of the proposition.

This organization, like the garage associations in several other states, is pushing a state lien law which will give the garagemen a lien on a car after it has left his possession; it also applies to accessory dealers. A committee to foster the measure consists of:

H. Penner, Riverside Park Garage; Mr. Jordan, Buick Motor Co.; C. Babcock, Babcock Auto Spring Co.; C. B. Dunbar, Wisconsin Garage; O. F. Fishedick, Auto Supply Co.; H. A. Torrey, Torrey Service Garage; E. Swendson, Dorsey & Swendson.

The organization has not yet secured a paid secretary but is considering this action; Roland Moeller, 798 3rd street, is acting as secretary. The organization has named these committees: Membership, legal and legislative, garage and repairs, tires and vulcanizing, automobile dealers, manufacturers and jobbers in accessories, body building and painting, press, entertainment, credit, advertising, welding and lamp and radiator repairs, cost and accounting systems, auditing and gasoline and oil.

New York Dealers Meet

At the annual meeting of the Automobile Dealers Association of New York State, which was held in Buffalo, N. Y., on Thursday last, all of the directors were reelected with the exception of the director representing Rochester, no delegate for this city having been named. The directors include: Ralph E. Brown, Buffalo; Chauncey D. Hakes, Albany; R. H. Johnston, New York; George N. Norris, Syracuse; Herbert L. Carpenter, Brooklyn, N. Y.; Emanuel Lascaris, New York; H. J. Hartwell, Troy. The meeting placed itself on record as being opposed to the Hewitt-Sullivan measure, which, as was told last week in Motor World, would double the license fee on pleasure vehicles and impose a heavy burden on the operators of commercial vehicles. It was the consensus of opinion that if the measure were enacted into law the association would refuse to pay the increased fees and would attack the con-

stitutionality of the measure in the courts.

North Dakota and Western Association

W. M. Ball was elected president of the North Dakota and Western Minnesota Automobile Dealers Association which was formed last week in Fargo, N. D., following preliminary work done at the Fargo automobile show. Associated with Ball are the following: Vice-president, George Shas; treasurer, R. L. English; secretary, J. D. Grant. The board of directors includes: J. Schranz, Moorhead; J. W. Murphy, Fargo; W. W. King, Fargo.

Trade Good About Bloomington

Central Illinois dealers are gratified over the unexpected heavy business in cars this spring. March came in with a hurricane of orders and promises to go out with no diminution. The secretary of state's office estimated that the number of licenses in 1915 would aggregate 200,000, an increase of 68,000 over 1914, twice the increase reported last year. Dealers in this territory are convinced, from the number of cars that are being moved out, that the state officer was not far from right, as sales so far in McLean and adjoining counties are 20 per cent heavier than in the same period of 1914.

Dealers, in addition to reporting more sales than last year, state that they have a larger number of prospects, that inquiries have been more numerous and visitors around the garages have been greater than ever before.

There has been a marked change in the system of working up buyers. Formerly the dealers limited their efforts to men or women who were known to have expressed a desire to own a car or who made some inquiries of the salesmen. The up-to-the-minute firm now makes out a list of men or women who can afford to own one and starts a campaign upon each.

Kentucky Dealers Band Together

The Central Kentucky Automobile Dealers Association, with headquarters in Lexington, was formed at a meeting held March 19. S. B. Featherston, of the Marshall-Featherston Motor Co., Chalmers dealer, was elected president, the other officers elected being: Vice-president, V. K. Dodge; secretary, H. C. McEldowney; treasurer, T. B. Dewhurst.

Spring Replacements at Trade Price

Smalley Daniels, manufacturers' distributor, Detroit, has completed arrangements under which garagemen and repair-shop operators can obtain replacement springs, produced by the New Era Spring & Specialty Co., for all makes of cars at trade price without the necessity for purchasing them through the maker of the car for which they are intended.

SPRING SHOW BEST SAY PITTSBURGH'S DEALERS

Five Thousand People Attend Affair Held Last Week—Business Conditions Improving and Prospects Good

The Automobile Dealers Association of Pittsburgh, Inc., believes that a spring show is after all the best medium through which to reach the big army of automobile buyers in the Pittsburgh district. Its tenth annual show was put on at Motor Square Garden in the East End Saturday night, March 13, and closed March 20.

About 5,000 people attended the opening night. The main decorative theme was the American flag, and the mass of stars and stripes draped from the roof and festooned on the big chandeliers made a very pleasing effect. This was typically a springtime show. The open car predominated everywhere. While there were plenty of large bodies, there was a surprisingly large number of runabouts and roadsters, which suggests a tendency toward the small car.

Dealers report a much larger number of medium-class buyers this year than last. There is every prospect that the cars which the ordinary man of business or professional man can afford to buy will be sold in larger numbers this year than at any time since 1912 and perhaps more than ever before. The costly cars are not going to be passed up, but the increase in the average-price buyer is the most encouraging feature in the situation.

General business conditions in and about Pittsburgh are improving and with the thousands of prospects which the Pittsburgh firms have on their lists for spring sales a big spurt in spring selling seems likely.

Florida Supply Jobbers to Organize

For the purpose of meeting their problems, which differ greatly from those of more northern sections, the accessory and supply jobbers in Tampa, Fla., and vicinity contemplate the formation of an association. The plan has been under consideration for some time and a majority of the trade concerns are ready to cooperate, according to G. Norman Baughman, of the G. Norman Baughman Co., Tampa.

Whereas the live months in the North are during the warm weather, the heavy business of the Tampa men is during the northern winter; many of them combine electrical and automobile goods. Climatic conditions, Baughman states, are different, and business methods are not the same as in the north. One of the contemplated features of the work is a central credit bureau.

central credit bureau, where members may secure the ratings of their customers.

Oppose Truck Limitations

Limitations of the size, speed and weight of motor trucks in New York City, which is proposed by a city committee, is being opposed by the Motor Truck Club of America, the National Automobile Chamber of Commerce, the Society of Automobile Engineers, the Electric Vehicle Association of America and the New York Team Owners Association.

The representatives of these five bodies appeared last Friday, March 19, before a hearing by the Mayor's Committee on Street Traffic and Safety, to object to the proposed rules which provide: Length limits of 28 feet, width of 7½ feet and 12½ feet height for motor trucks and horse-drawn vehicles; speed of not more than 8 miles and weight of not more than 14 tons.

The vehicle representatives contended that these rules would throw into the discard a great many horse-drawn trucks and vans; it was contended that one big unit is less likely to congest traffic than two smaller units and that the seemingly undue proportion of accidents with trucks as compared with pleasure cars is because the trucks run all day long and on the busiest streets, while pleasure cars are driven less and are often driven in the parks and the country, where traffic is less congested and there are fewer pedestrians on the roads.

Chevrolet Buys Second Tarrytown Plant

The Beekman avenue plant in Tarrytown, N. Y., formerly occupied and owned by the Maxwell-Briscoe Motor Co., has been sold to the Chevrolet Motor Co., of New York. The plant comprises about 20 acres, with buildings containing about 150,000 square feet of floor space, and was held at \$250,000. The Chevrolet company will use the property for the production of its \$490 car and will, beginning June 1, produce about 5,000 of this model a month.

Chamber Not Co-defendant

In MOTOR WORLD of March 17th, in the report of a decision of Judge John H. Clark sustaining the complaint of Wm. B. Hanlon against the Rauch & Lang Carriage Co. on the Hanlon windshield patent, covering an adjustable independent glass rain panel mounted in front of the windshield, it was stated that the National Automobile Chamber of Commerce was a co-defendant. This was an error of the correspondent, as the record shows that an effort to have the N. A. C. C. brought into the suit as a co-defendant was overruled by the court. Subsequently an independent suit by Hanlon against N. A. C. C. was dismissed by the court.

CHAMPION TO SHARE ITS PROFITS WITH DEALERS

Each Dealer Receives by Check a Certain Share of Profits for Every Plug He Sells—How It Works

Marking the first appearance of the profit-sharing idea in fields other than those occupied by the motor car manufacturer, the Champion Spark Plug Co., Toledo, O., has put in operation a plan by which it will build up closer cooperation between itself and its dealers and at the same time materially stimulate the demand for Champion spark plugs. Under this plan, Champion dealers will receive by check from the Champion company an amount in proportion to the number of plugs they purchase through their jobbers. Cards are now being sent to all dealers upon which is to be entered the number of plugs the dealer will sell during the year. Upon the receipt of the card properly filled out and accompanied by the jobber's invoice from whom the plugs were purchased, the Champion company will mail the dealer direct a check representing his pro rata share of the extra profits.

It is pointed out that a dealer need not handle Champion spark plugs exclusively to be eligible under the profit-sharing plan, though he must take the number of plugs he enters on his card. These may include any of the standard Champion products, such as the Champion Ford, Champion Buick, Champion O or X, Heavy Stone, Priming Plug and Motorcycle. That there is little danger of the dealer overstocking is made plain by the fact that any plug found unsalable during the year of its purchase may be exchanged for another type.

The Champion company is now producing an average of 26,000 plugs a working day, and it is expected that this profit-sharing plan will increase the output to 40,000 or more per day.

Would Simplify Compensation

The MacDonald bill, which eliminates the Compensation Commission as a necessary factor in the payment of claims under the Workmen's Compensation law which recently went into effect, has been passed by both the New York Senate and Assembly, and it is expected that it will receive the governor's signature and thus become a law.

Under the compensation law, as at present in force, all payments to workmen must be made through the Compensation Commission. The MacDonald bill amends Sections 20, 25 and 26 of the law and provides that an injured workman, or, in the case of death, his chief dependent, may present his claim to his employer direct instead of through the commission as heretofore necessary. It is further provided, however, that the workman may present his claim to the com-

mission if the employer rejects it or if within ten days after it has been presented an agreement for compensation, signed by both parties, is not made and filed with the commission.

Where such an agreement is filed, the commission is required to examine it, and if it is in accordance with the law to approve it, when it becomes an award, independent of the agreement; if it should differ from the agreement, the award of the commission prevails. The commission is given power to impose on the employer a penalty of not more than 10 per cent of the award where there is unfair dealing or bad faith on the part of the employer in connection with the settlement.

Should the employer be insured either with the State Fund or with a casualty company, reimbursement from either agency is provided for in the bill for any amount paid to an injured employee, or to his dependents in case of death, upon presentation of proper receipts for the money paid. As the law is at present, intentional default of payment of compensation claims on the part of an employer would entail a penalty of 50 per cent of the entire amount of compensation; under the MacDonald bill this is reduced to 10 per cent.

Willys-Utility Becomes Garford

The manufacture of Garford and Garford-Utility trucks has been started by the Garford Motor Truck Co., Lima, O. As announced a few weeks ago, the Geiger-Jones Co., Canton, O., has purchased the motor truck interests of the Willys-Overland Co., which consisted of the manufacture and sale of both the Garford and the Willys-Utility trucks. This entire line henceforth will be manufactured under the Garford name, the Willys-Utility becoming the Garford-Utility.

E. A. Williams, Jr., heads the new company, which has taken over the Lima factory together with all vehicles on hand and the service stations in the eastern states. Williams was in New York City recently, supervising the final arrangements of his New York distributor, the R. E. Taylor Corp., for consolidating under on roof all the Garford company's interests in that territory, now distributed in three places. This consolidation will be in the garage at 427 West 42nd street, occupied by the old Gramm company. This company is also in charge of the Boston branch. H. C. Whitney is in charge at Philadelphia.

Other officials in the new company are: J. B. Immler, of Canton, associated with the Geiger-Jones Co., vice-president and secretary, and A. Stull, of Lima, treasurer.

Studebaker Dealers Talk Policy

DETROIT, MICH., March 23—One hundred and twenty Michigan Studebaker dealers met at a convention at the plant of the Studebaker Corp., Detroit, last Friday, the object being to enable as many of the state dealers as possible to get acquainted with each other. Sales Manager E. R. Benson presided, and the Studebaker sales policy and business details were discussed; suggestions were made as to what can be done to improve business and give more service. Following the convention, the dealers were tendered a banquet at the Tuller.

The opinion was practically unanimous that business is better in all territories that at any time during the last few years and that the future outlook is most encouraging.

OLDFIELD WINNER WHEN LEWIS FAILS AT VENICE

Oldtime Driver Takes First Instead of
Second in Maxwell—Carlson Pulls
Into a Close
Second

Snatching a victory at the eleventh hour, Barney Oldfield, driving a Maxwell, won the first Venice Grand Prize at Venice, Cal., on St. Patrick's day, while his team mate, Billy Carlson, whirled another Maxwell into second place only 34 seconds behind the leader. Ruckstall, Mercer, was third; Marquis, Bugatti, fourth; and Hearne, Case, fifth. Oldfield's average speed for the 300 miles was 68.18 miles an hour.

Probably Oldfield himself did not expect to win the race as the last lap came in sight; but shortly before the completion of the next to the last circuit Dave Lewis' Stutz, which was leading and was practically conceded the race, went down and out and was unable to finish. Oldfield's time was 4:24:09½; Carlson's, 4:24:43½, and Ruckstall's, 4:27:27½.

Durant and Disbrow were the only ones left when Hearne finished, Disbrow getting the flag in the 96th lap and Durant in the 90th.

The weather was fine, the temperature was 85 in the shade, and the race was watched by 75,000 spectators. Things were quite exciting from the very start. Kennerdell ruled out Louis Nikrent, who at the last moment had entered the Californian, a special Mercer, and Hughie Hughes. Pullen, in a Mercer, eliminated himself in the act of starting by stripping his gears; he did not even get away.

From the first to the 20th lap the pack was led by Rickenbacher in a Maxwell; Ruckstall's Mercer was second, but at the end of lap 20 was two laps in the rear of the flying Maxwell. Ruckstall did not stay long in the rear, however, for by the 55th lap he was leading, with Hearne, Case, second; Lewis, Stutz, third, and Oldfield fourth. The average speed for this lap was about 71 miles an hour.

By the 70th lap Lewis had pulled his Stutz from third into first place. Hearne had dropped back to second and Carlson and Oldfield were third and fourth; the speed was maintained at 71 miles an hour.

At the 80th lap the drivers maintained the same relative positions, but they had to work a little harder for it, and the average speed went up to 71.5 miles an hour. They stuck to their positions up to the 90th lap by dint of still greater speed, the average going up to 72 miles an hour.

In the 90th lap there were changes. Oldfield managed to work up ahead of his team mate, Carlson, and both got

between Hearne and the finish line. Then Lewis' engine failed and the field swept past him in a hurrying procession.

During the race there were several diversions of one sort and another. In the 20th lap the scoreboard toppled over, carrying with it 20 men, two of whom were sufficiently injured to make a trip to the hospital necessary. Of a more cheerful nature was the appearance overhead of Caleb Bragg in Glen Martin's aeroplane, carrying, besides the driver, Martin and Engineer Kliesrath of the Bosch company. The big bird circled the course three times. In lap 55 Marquis' Bugatti hit a spectator, injuring his legs.

Previous to the race the Napier, entered and driven by Orville Jonas, was wrecked in practice. Cooper was to have driven the Stutz which was piloted by Grant, but had to withdraw on account of an attack of tonsillitis.

Indianapolis Proposes 1,000-Mile Race

The officials of the Indianapolis Speedway are nothing if not ambitious. It is proposed now to run off a 1,000-mile race with a total prize of \$100,000 and \$50,000 to the winner. And to make it doubly interesting, only cars which have won first prizes in previous 500-mile races would be eligible. This would let in only four makes, Marmon, 1911 winner; National, 1912; Peugeot, 1913, and Delage, 1914. It is suggested that each maker nominate from three to five cars. It is also suggested that to be eligible the cars be required to show a speed of 90 miles an hour for 20 laps of the track.

Grant's Car a Stutz, Not a Case

The car with which Harry Grant came to grief in the Vanderbilt cup race, through no fault of himself or the car, but because water inadvertently was put in the fuel tank instead of gasoline, was a Stutz, and not, as inadvertently was stated last week, a Case. The three Stutz cars were driven by Anderson, Wilcox and Cooper, Grant taking the wheel of Cooper's car when the latter was taken sick.

REGISTRATION TRANSFER FACILITATED IN JERSEY

May Now Transfer Ownership from Car
to Car or Car from Owner to
Owner—Certain Dealer
Requirements

A car registration may be transferred from one car to another or from one owner to another, according to an act just passed by the New Jersey legislature.

There are, therefore, two separate classes of transfer now in effect, namely, from one owner to another for the same car, and from one car to another by the same owner.

In transferring from car to car it is necessary for the applicant to fill out an application blank to fit the description of the new car, pay the transfer fee of \$1, and surrender the original registration card. The dealer should change the seals on the tags to correspond with the new car.

If the new car belongs to a higher class of horsepower than the car originally registered, not only the transfer fee of \$1 must be paid, but the difference between the fee paid originally and that due if the motor vehicle be properly registerable in a higher class.

If the transfer is to a car of a higher class, the transfer fee, plus the additional amount of registration charged will be entered in the same place on the transfer application.

Oldfield and Carlson Again Win

Following up their victory in the Venice race a few days before, the veteran Barney Oldfield, and his team mate, Billy Carlson, both in Maxwells, finished one, two in the 100-mile road race staged in Tucson, Ariz., on Saturday, March 20. Oldfield averaged better than 66 miles an hour over a dusty 4-mile desert course and Carlson also bettered this figure. There were 18 starters and a great crowd watched the race.

THOSE WHO WON AND THOSE WHO FAILED

Driver	Car	Time	Average
Oldfield	Maxwell	4:24:09½	68.18
Carlson	Maxwell	4:24:43½	67.98
Ruckstall	Mercer	4:27:27½	67.30
Marquis	Bugatti	4:31:39	66.40
Hearne	Case	4:44:51	62.30
Disbrow	Simplex	Flagged, lap 96	
Durant	Chevrolet	Flagged, lap 90	
Lewis	Stutz	Out, lap, next to last	
Parsons	Parsons Sp.	Out, lap 67, broken valve	
Rickenbacher	Maxwell	Out, lap 51, tore oil line off	
.....	Chalmers	Out, lap 49, cracked cylinder	
Grant	Stutz	Out, lap 48, broken radiator	
Klein	King	Out, lap 43, broken crankshaft	
Neiswander	.....	Out, lap 39, cracked cylinder	
Newhouse	Delage	Out, lap 21, broken connecting rod	
Le Cain	Chevrolet	Out, lap 4, broken radiator	
Wilson	National	Out, lap 2, broken cylinders	

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

NOTE. The figures given in columns underneath 2, 5- and 7-passenger, represent the list catalog prices of the models. Where a tire size is given, as for instance "37x5½", it means that the rear tires are 37x5½ and the front are of smaller dimension.

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT												
O	4-3/4x4	22.5	Disco	Johnson	Disco	Disk	3 108	32x3 1/2	850	870	....	....
M	4-3/4x4	22.5	Bosch	Stmbg	N E	Disk	3 108	32x3 1/2	995	995	....	....
LAMBERT												
48-C	4-3/4x4	22.5	Briggs	Shblr	Briggs	Frm Trs	112	32x3 1/2	1,200	1,200	....	....
68-C	4-4 1/2x5 1/2	27.2	Briggs	Shblr	Briggs	Frm Trs	117	34x3 1/2	1,565	1,565	....	....
LENOX												
Four	4-4 1/2x5 1/2	29.0	Wths	Own	Wths	Cone	3 118	34x4 1/2	2,000	2,000	....	....
Six	6-3/4x5 1/2	33.7	Wths	Own	Wths	Cone	3 130	34x4 1/2	2,465	2,465	....	....
LEWIS												
VI	6-3/4x6	29.4	Briggs	Stmbg	Remy	Disk	3 135	36x4	1,600	1,600	....	....
LEXINGTON												
Four	4-3/4x5 1/2	24.2	Wths	Shblr	Wths	Disk	3 115	34x4	1,375	1,375	....	....
6-L	6-3/4x5	29.4	Wths	Shblr	Wths	Disk	3 128	34x4	1,875	1,875	....	....
6-M	6-4 1/2x5	40.8	A. Kent	Stmbg	Jesco	Cone	3 130	36x4 1/2	2,575	2,575	2,675	....
LOCOMOBILE												
M-5	6-4 1/2x5 1/2	48.6	Bosch	Own	Wths	Disk	4 140	37x5	5,100	5,100	5,100	....
R-5	6-4 1/2x5	43.5	Bosch	Own	Wths	Disk	4 132	37x5r	4,400	4,400	....	....
LUVERNE												
700	6-4 x5	38.4	Bosch	Shblr	Jesco	Disk	3 128	36x4 1/2	....	....	2,500	....
LYONS-KNIGHT												
K-4	4-4 1/2x5 1/2	32.4	Simms	Stmbg	N E	Disk	3 130	37x5	....	2,900	2,930	....
MARION												
...	3-3/4x4 1/2	31.2	Bosch	.....	G & D	Disk	3 115	34x4	1,500	1,500	....	....
...	6-3 x5	21.6	Bosch	.....	G & D	Disk	3 122	34x4	....	1,350	....	....
...	4-3/4x5	22.5	Bosch	Rafld	G & D	Disk	3 115	34x4	....	1,250	....	....
MARMON												
41	6-4 1/2x5 1/2	43.5	Bosch	Stmbg	Bosch	Cone	3 132 1/2	36x4 1/2	3,250	3,250	3,350	....
48	6-4 1/2x6	48.6	Bosch	Zenith	Both	Disk	3 145	37x5r	....	....	5,000	....
MAXWELL												
25	4-3/4x4 1/2	21.0	Simms	Kingstn	Simms	Cone	3 103	30x3 1/2	725	750	....	....
McFARLAN												
T	6-4 x6	38.4	Wths	Stmbg	Wths	Cone	3 132	36x4 1/2	2,500	2,500	2,500	....
X	6-4 1/2x6	48.6	Wths	Stmbg	Wths	Cone	3 132	36x4 1/2	2,900	2,900	2,900	....
MINTYRE												
25	4-3/4x5 1/2	19.6	Bosch	Stmbg	G & D	Cone	3 106	32x3 1/2	....	850	....	....
6-40	5-3/4x4 1/2	29.4	Briggs	Stmbg	Briggs	Disk	3 120	35x4	....	1,275	....	....
MERCER												
8pdtr	4-3/4x6 1/2	22.5	Bosch	Zenith	U S L	Disk	4 120	34x4 1/2	2,750	....	....	....
...	4-3/4x6 1/2	22.5	Bosch	Zenith	U S L	Disk	4 130	34x4 1/2	....	3,000	....	....
METEOR												
42	4-4 x5	25.6	A. Kent	Stmbg	Spldf	Disk	3 114	34x4	....	1,075	....	....
45	6-3/4x5	33.7	A. Kent	Stmbg	Spldf	Disk	3 126	35x4	....	1,395	....	....
METZ												
22	4-3/4x4	22.5	Bosch	Own	G & D	Frm Trs	96	30x3	495	....	....	....
25	4-3/4x4	24.2	.....	A W T	G & D	Frm Trs	105	32x3 1/2	....	600	....	....
MITCHELL												
Four	4-4 x5 1/2	25.6	Conn	Rafld	Spldf	Cone	3 116	34x4	1,250	1,250	....	....
Six	6-4 x5 1/2	38.4	Conn	Rafld	Spldf	Cone	3 128	36x4	1,585	1,585	....	....
7-6	6-4 1/2x7	43.5	Remy	Rafld	Remy	Cone	3 144	37x5	....	2,350	....	....
5-6	6-4 1/2x6	43.5	Remy	Rafld	Remy	Cone	3 132	36x4 1/2	1,895	1,895	....	....
MOLINE-KNIGHT												
...	4-4 x6	25.6	Bosch	Shblr	Wagner	Cone	4 128	36x4 1/2	2,500	2,500	2,500	....
40	4-3/4x5	19.6	Conn	.....	.....	Cone	3 118	34x4	....	1,475	....	....
MONARCH												
Six	6-3/4x5	29.4	A. Kent	Zenith	W. Lard	Cone	3 125	33x4	....	1,250	1,275	....
MONROE												
M-2	4-3 x3 1/2	14.4	Conn	Zenith	A-Lite	Cone	3 96	30x3	460	....	....	....
MOON												
4-38	4-3/4x5	22.5	Delco	Rafld	Delco	Disk	3 122	34x4	1,350	1,350	....	....
6-40	6-3/4x5	29.4	Delco	Rafld	Delco	Disk	3 122	34x4	1,575	....	....	....
6-50	6-3/4x5 1/2	33.7	Delco	Rafld	Delco	Disk	4 130	35x4 1/2	2,150	....	....	....
MORSE												
D	4-4 1/2x5	34.2	Elsmn	Stmbg	G & D	Disk	4 127	36x4 1/2	3,600	3,600	3,600	....
NATIONAL												
AB	6-3/4x5 1/2	33.7	Elsmn	Rafld	Wths	Cone	3 134	36x4 1/2	2,375	2,375	....	....
NORWALK												
F	6-3/4x5 1/2	29.4	A. Kent	Rafld	G & D	Disk	4 131	37x4	1,875	....	....	....
OAKLAND												
37	4-3/4x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,150	1,200	....	....
49	6-3/4x5	29.4	Delco	Johnson	Delco	Cone	3 123 1/2	35x4 1/2	....	1,885	....	....
Spdtr	4-3/4x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,100	....	....	....
OGREN												
Six	6-3/4x5 1/2	33.7	Bosch	Rafld	B-Rshm	.....	3	....	....	....	2,500	....
OLDSMOBILE												
42	4-3/4x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,285	1,285	....	....
55	6-4 1/2x5 1/2	43.5	Delco	Marvel	Delco	Cone	3 139	36x5	....	2,975	....	....
OVERLAND												
80	4-4 1/2x4 1/2	27.2	Bosch	Shblr	A-Lite	Cone	3 114	34x4	1,050	1,075	....	....
81	4-4 x4 1/2	25.6	Spldf	Shblr	A-Lite	Cone	3 106	33x4	795	850	....	....
82	6-3/4x5 1/2	29.4	Bosch	Shblr	A-Lite	Cone	3 125	35x4 1/2	....	....	1,475	....
OWEN												
...	6-3/4x5 1/2	33.7	Owen	Master	O M	O M	186	35x5	3,750	....	3,750	....
PACKARD												
3-38	6-4 x5 1/2	38.4	Bosch	Own	Bljur	Plate	3 140	37x5r	3,750	3,750	3,850	....
5-48	6-4 1/2x5 1/2	48.6	Bosch	Own	Bljur	Plate	3 144	37x5	4,750	4,750	4,850	....
PAIGE												
Six	6-3/4x5 1/2	29.4	Bosch	Rafld	G & D	Disk	3 124	34x4	1,385	....	1,385	....
38	4-4 x5	25.6	Bosch	Stwrt	G & D	Disk	3 116	34x4	1,075	1,075	....	....
PARTIN-PALMER												
20	4-3/4x4	15.6	A. Kent	Muir	G & D	Disk	3 96	28x3	495	....	....	....
38	4-3/4x5 1/2	22.5	A. Kent	Stmbg	G & D	Done	3 115	33x4	1,075	....	....	....
PATERSON												
4-32	4-3/4x5	19.6	Delco	Stmbg	Delco	Cone	3 112	33x4	....	1,095	....	....
6-48	6-3/4x5	29.4	Delco	Stmbg	Delco	Cone	3 124	34x4	....	1,495	....	....
PATHFINDER												
...	6-3/4x5 1/2	33.7	Wths	Shblr	Wths	Disk	4 125	34x4 1/2	2,222	....	2,322	....

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PEERLESS												
54	4-3/4x5	22.5	A. Kent	Stnbg	G & D	Disk	3 113	34x4	2,000	2,000	....	....
55	6-3/4x5	29.4	A. Kent	Stnbg	G & D	Disk	3 121	34x4	2,250	2,250	....	....
48-6	6-4x6	48.6	Bosch	Own	G & D	Band	4 137	37x5	4,900	....	5,000	....
PETER PAN												
3-E	4-2 1/4x4 1/2	12.0	Bring	.....	.....	Disk	3 110	29x3 1/2	650	....	....	....
PIERCE-ARROW												
C-3	6-4 x5 1/2	38.4	Bosch	Own	Wths	Cone	4 134	36x4 1/2	4,300	4,300	....	....
B-3	6-4 1/2x5 1/2	48.6	Bosch	Own	Wths	Cone	4 142	37x5	4,900	4,900	5,000	....
A-3	6-5 x7	60.0	Bosch	Own	Wths	Cone	4 147 1/2	38x5 1/2	5,900	5,900	6,000	....
PILOT												
55	6-3/4x5 1/2	29.4	Wths	Shblr	Wths	Cone	3 126	34x4	1,885	1,885	1,985	....
75	6-4 1/2x6	48.6	Wths	Carter	Wths	Cone	3 132	37x4 1/2	2,835	2,885	2,885	....
PREMIER												
6-50	6-4 x5 1/2	38.4	Elsmn	Rafld	Remy	Disk	3 133	36x4 1/2	1,985	1,985	1,985	....
PRATT												
6-50	6-3/4x5 1/2	33.7	A. Kent	Rafld	G & D	Disk	4 132	37x4 1/2	2,150	2,150	2,250	....
PULLMAN												
Jr	4-3/4x4 1/2	22.5	Spldf	Stnbg	Spldf	Disk	3 110	30x3 1/2	740	740	....	....
6-48	6-3/4x5 1/2	33.7	Simms	Stnbg	Wths	Disk	4 134	36x4 1/2	2,500	2,500	2,550	....
RAYFIELD												
20	4-2 1/2x4 1/2	12.0	A. Kent	Own	.....	Disk	3 96	28x3	....	395	....	....
R-C-H												
K	4-3/4x5	16.9	Bosch	B-D	W. Lndr	Cone	3 110	32x3 1/2	....	775	....	....
REGAL												
D	4-3/4x5	22.5	A. Kent	Stwrt	Bosch	Cone	3 112	33x4	1,085	1,085	....	....
...	8-2 1/2x4 1/2	26.6	.....	Stwrt	B-Rshm	.....	112	33x4	1,250	1,250	....	....
...	4-3/4x3 1/2	18.2	.....	.....	Spldf	.....	3 106	30x3 1/2	650	650	....	....
REMINGTON												
...	4-3/4x4	15.6	A. Kent	.....	W. Lndr	Cone	3 106	30x3 1/2	695	695	....	....
Ghd	8-3/4x4 1/2	31.2	A. Kent	Zenith	G & D	Disk	3 116	35x4 1/2	1,395	....	....	....
REPUBLIC												
E	6-4 1/2x5	43.5	Delco	Rafld	Delco	Cone	4 133	36x4 1/2	....	2,950	3,000	....
REO												
M	6-3 9-16x5 1/4	30.4	Remy	Johnsn	Remy	Disk	3 122	34x4	....	1,385	....	....
ST	4-4 1/2x4 1/2	27.2	Natnl	Holley	Natnl	Disk	3 112	34x4	1,000	....	....	....
R	4-4 1/2x4 1/2	27.2	Remy	Holley	Remy	Disk	3 115	34x4	....	1,020	....	....
ROSS												
A	8-3 x4 1/2	28.8	.....	.....	Own	Disk	3 115	34x4	....	1,350	....	....
SAXON												
A	4-2 1/2x4	11.2	A. Kent	Mayer	.....	Plate	2 96	28x3	395	....	....	....
B2	6-2 1/2x4 1/2	20.0	A. Kent	.....	G & D	Disk	3 112	32x3 1/2	....	785	....	....
SCRIPPS-BOOTH												
C	4-2 1/2x4	13.3	A. Kent	Zenith	Bijur	Disk	3 110	30x3 1/2	775	....	....	....
SPAULDING												
H	4-4 1/2x5 1/2	29.0	Simms	Rafld	Entz	Cone	2 120	36x1	....	1,680	....	....
S. G. V.												
J	4-3/4x4 1/2	24.2	Bosch	Zenith	W. Lndr	Disk	4 118	34x4	3,300	3,300	....	....
SIMPLEX												
38	4-4 1/2x6 1/2	38.2	Bosch	Nwcm	Bosch	Disk	4 137	37x5r	All bodies to order	....	....	....
50	4-5 1/2x6 1/2	46.3	Bosch	Nwcm	Bosch	Disk	4 137	37x5r	All bodies to order	....	....	....
SINGER												
Six	6-4 x5 1/2	38.4	Elsmn	C R G	Wths	Disk	4 135	36x4 1/2	2,350	2,350	....	....
SPEEDWELL												
I	6-4 1/2x5 1/2	40.8	Wths	Shblr	Wths	Disk	3 135	37x5	....	....	2,950	....
SPHINX												
A-15	4-3/4x5	16.9	Spldf	Mayer	Spldf	Cone	3 112	30x3 1/2	....	695	....	....
STEARNS												
L-4	4-3/4x5 1/2	22.5	Bosch	Shblr	G & D	Cone	3 119	34x4	1,750	1,750	....	....
8-K-4	4-4 1/2x5 1/2	29.0	Bosch	Stnbg	G & D	Disk	3 127	36x4 1/2	3,750	3,770	3,900	....
S-K-6	6-4 1/2x5 1/2	43.5	Bosch	Stnbg	G & D	Disk	4 134	37x5	4,850	4,850	5,000	....
STUDEBAKER												
4-SD	4-3/4x5	19.6	Remy	Shblr	Wagner	Cone	3 104	33x4	985	985	....	....
6-E-C	6-3/4x5	29.4	Remy	Shblr	Wagner	Cone	3 121	34x4	1,385	1,385	1,450	....
STUTZ												
H-C-S	4-3/4x5	22.5	Remy	Stnbg	Remy	Cone	3 108	32x4	1,475	....	....	....
Br. Cat	4-4 1/2x5 1/2	36.1	Bosch	Stnbg	Remy	Cone	3 120	34x4 1/2	2,000	....	....	....
Six	6-4 x5	38.4	Elsmn	Stnbg	Remy	Cone	3 129	34x4 1/2	2,125	....	....	....
T Car	4-4 1/2x5 1/2	36.1	Bosch	Stnbg	Remy	Cone	3 130	34x4 1/2	....	2,275	....	....
T Car	6-4 x5	38.4	Elsmn	Stnbg	Remy	Cone	3 130	34x4 1/2	....	2,400	....	....
TOURNAINE												
12	6-4 x5 1/2	38.4	Simms	Zenith	Wths	Disk	4 124	34x4 1/2	3,150	3,150	3,270	....
TRUMBULL												
15-AB	4-2 1/2x4	13.3	Spldf	Breeze	W. Lndr	Cone	3 80	28x3	395	....	....	....
TWOBLY												
...	4-3 1/2x4	15.6	Spldf	Zephyr	Undec	Cone	3 100	30x3	660	770	....	....
VELIE												
4-45	4-4 1/2x5 1/2	34.2	Bosch	Stnbg	G & D	Disk	4 121	37x4 1/2	1,750	1,750	....	....
6-50	6-3/4x5 1/2	33.7	Bosch	Stnbg	G & D	Disk	4 129	37x4 1/2	2,015	2,015	....	....
Blowl	6-3/4x5	29.4	A. Kent	Stnbg	G & D	Disk	4 124	34x4	1,585	1,585	....	....
VIXEN												
8-B	4-2 1/2x4	12.0	A. Kent	Zephyr	.....	.....	106	28x3	305	....	....	....
VULCAN												
...	4-3/4x5 1/2	19.6	Wths	.....	Wths	Disk	3 120	32x3 1/2	975	975	....	....
WESTCOTT												
O	4-3/4x5	19.6	Delco	Shblr	Delco	Cone	3 113	33x4	1,185	1,185	....	....
U	6-3/4x5	29.4	Delco	Rafld	Delco	Cone	3 125	34x4	....	1,585	....	....
WHITE												
30	4-3/4x5 1/2	22.5	Bosch	Own	Own	Plate	4 115	32x4	2,650	2,700	....	....
45	4-4 1/2x6 1/2	29.0	Bosch	Own	Own	Plate	4 132 1/2	36x4 1/2	....	....	3,800	....
60	6-4 1/2x5 1/2	43.5	Bosch	Own	Own	Plate	4 140 1/2	37x5	All bodies to order	....	....	....
WILLIS-KNIGHT												
K-19	4-4 x5 1/2	25.6	Simms	Zenith	U S L	Cone	4 120	36x4 1/2	....	2,475	....	....
WINTON												
21	6-4 1/2x5 1/2	48.6	Bosch	Rafld	Alr or Elec	Disk	4 136	37x5	3,250	3,250	3,500	....
21A	6-3 1/2x5 1/2	31.5	Bosch	Rafld	Bijur	Disk	4 128	36x4 1/2	2,285	2,285	....	....
WOODS MORIETTE												
3	4-2 1/2x4	10.0	Minto	Mayer	.....	Cone	2 104	28x2 1/2	320	....	....	....

Motor Car Dealers Recently Established

COMMERCIAL VEHICLES

KENTUCKY

Place	Car	Dealer
Louisville	Vim	P. M. Antriot & Sons
Louisville	Service	J. Weber's Sons

MISSOURI

St. Louis	Willcox	Sullivan Mfg. Co.
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NEBRASKA

Beatrice	Koehler	J. L. Schlick
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NEW JERSEY

Jamesburg	Koehler	J. Nodocker & Sons
Red Bank	Koehler	E. Von Kattengell
Morristown	Koehler	McElwee & Marshall

PLEASURE CARS

ARKANSAS

Prescott	Dodge	Ruffner's Garage
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CALIFORNIA

Pasadena	Grant	E. C. Anthony
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IDAHO

Nampa	Moon	W. E. Miller
St. Anthony	Oldsmobile	A. D. Miller, Sr.
Sandpoint	Hudson	H. S. Allen

ILLINOIS

Alton	Paige	J. T. Corbett
Edwardsville	Paige	Tuxhorn Bros.
Litchfield	Paige	G. T. Lackey
Marion	Oakland	Peebles-Woodside
Mascoutah	Mix	W. E. Karch
Mt. Vernon	Oakland	Threlkeld Bros.
New Holland	Moon	P. H. Ryan
St. Jacobs	Metz	National Garage

INDIANA

Aurora	Buick	Caulfield Lunkeyer
Hatsville	Buick	Pohlar Auto Co.
Roanokeville	Buick	W. P. Zint
Borden	Buick	A. McKinley
Brookville	Buick	Kirshbaum Bros.
Corydon	Studebaker	J. W. Grable
Evansville	Buick	E. Day
Holten	Buick	F. Hill
Jeffersonville	Mitchell	G. W. Patton
Liberty	Buick	Stanley Motor Co.
Mt. Vernon	Buick	J. G. Herman
Salem	Mitchell	G. W. Patton
Vevay	Buick	Protsman & O'Neil
Vevay	Studebaker	Protsman & O'Neil

IOWA

West Liberty	Moon	Walte & Faies
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KENTUCKY

Ashland	Buick	Lutz & Weaver
Barbourville	Buick	A. D. Smith
Bowling Green	Buick	Bowling Green Garage
Bowling Green	Reo	E. R. Bagby
Campbellburg	Buick	W. V. Campbell
Campbellsville	Hudson	Buchanan-Lyons Co.
Carlisle	Buick	Ratliff Leford & Martin
Cave City	Reo	Steen & Bethel
Central City	Buick	Barnes Auto Co.
Central City	Hudson	Barnes Auto Co.
Danville	Buick	Conn & Mahan
Dawson Springs	Hudson	T. E. Lutz
Elizabethtown	Hudson	B. L. Jackson
Elizabethtown	Studebaker	A. H. Douglas
Emmence	Hudson	A. T. Berry
Frankfort	Reo	Nichol Bros.
Frankfort	Hudson	Frankfort Motor Car Co.
Fulton	Buick	J. E. Browder
Georgetown	Buick	Georgetown Motor Car Co.
Glasgow	Studebaker	Glasgow Motor Car Co.
Glasgow	Buick	Bradford Bros.
Harrodsburg	Buick	T. J. Ingram
Hodgesville	Studebaker	D. G. Hayes
Kevil	Buick	Viles & Halley
La Grange	Hudson	P. S. Head
Lawrenceburg	Hudson	Vanarsdale-Cole-Marrs Veh. Co.
Lawrenceburg	Buick	Stange, Hawkins & Witherspoon
Lebanon	Buick	W. B. Samuels
Lebanon	Hudson	Lewis & Drye
Lebanon	Studebaker	T. M. Estes
Lexington	Reo	Cegar-Rumly Co.
Lexington	Buick	Marshall Featherstone Mot. Co.
Louisville	Reo	Standard Auto Co.
Louisville	Cole	Stanford Auto Co.
Louisville	Argo	Argo Motor Agency
Mays Jack	Buick	C. A. Collins & Co.
Middlesboro	Buick	Brahaer & Brummett
Milton	Buick	D. T. Volers
Morganfield	Buick	H. C. Davis
Mt. Sterling	Buick	Stone & Flora
Murray	Buick	Morris Bros., Purdon Co.
Owensboro	Hudson	Central Motors Co.
Owensboro	Reo	Dexter & Lindley
Owensboro	Buick	Barnes Auto Co.
Paduach	Hudson	Home Garage
Paduach	Buick	Kentucky Auto Machine Co.
Paris	Buick	Pritchard & Ball
Providence	Buick	Sugg & Snow
Richmond	Buick	Richmond Auto Co.
Sanders	Reo	C. Sanders
Shelbyville	Buick	Turner Wilkinson
Shelbyville	Studebaker	E. R. Wilson
Somerset	Buick	J. M. Owens
Springfield	Studebaker	McClure & Mays
Sturgis	Buick	J. O. McCauley

Place	Car	Dealer
Waddy	Buick	A. S. Hedden
Walton	Buick	R. Edwards
Williamstown	Buick	Williamstown Motor Car Co.
Winchester	Buick	Winchester Garage Co.

MISSOURI

Jefferson City	Moon	W. F. Petry Garage
Laclede	Metz	P. F. Weaver
St. Louis	Scripps-Booth	Locust Motor Sales Co.

MONTANA

Great Falls	Oldsmobile	The Standard Garage Co.
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NEBRASKA

Jansen	Oldsmobile	Friesen & Co.
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NEW YORK

Albany	Moon	Baldwin Bros.
Elmira	Moon	Taylor Garage

OHIO

Alliance	Buick	Sherman Craft
Amlin	King	J. Shier
Ashley	Buick	E. Shaw
Hollier	Buick	J. O. Lash & Son
Bucyrus	Buick	Heinie & Beach
Burton	Buick	S. D. Strong
Cincinnati	Grant	Eureka Auto Co.
Circleville	King	E. O. Martin
Columbus	Grant	Miller-Main Garage
Condit	Buick	T. DeWitt

Literature Received

Allen Motor Co., Fostoria, O.—The 1915 Allen catalog, just off the press, is something new along the catalog line. It is so arranged and illustrated as to give the reader a comprehensive idea of Allen cars and the Allen organization, even though he has but a few minutes to glance at it. It folds up in wallet style, making it convenient to put in the inside pocket, yet the illustrations are amply large to show the cars up to good advantage. The text matter being printed in green can be easily read without tiring the eyes. The idea of the cover is to suggest to the mind the benefits and pleasure of owning an Allen car.

George Batten Co., New York—"Batten Average" is a little pocket size book that puts forth some of the things the salesman ought to know

in a way they have not been put forth before; it is good reading—for information or for amusement. It is chock full of pills of learning which are so cleverly sugarcoated that they can be assimilated without exertion and they don't leave a nasty taste. It is divided into 13 chapters, which are excerpts from a series of articles written by Carlisle N. Greig for the Chicago Daily News during the run of the Chicago show, and every chapter contains not one but many ideas that will put pep into a salesman.

Motor Car Securities Quotations

	March 30, 1914	March 30, 1915
	Bid Asked	Bid Asked
Ajax-Grieb Rubber Co., com.	290	285
Ajax-Grieb Rubber Co., pfd.	98	102
Chalmers Motor Co., com.	98	100
Chalmers Motor Co., pfd.	80	82
Firestone Tire & Rubber Co., com.	92	94
Firestone Tire & Rubber Co., pfd.	264	280
General Motors Co., com.	74	75
General Motors Co., pfd.	108	110
B. F. Goodrich Co., com.	90	92
B. F. Goodrich Co., pfd.	22	24
Goodyear Tire & Rubber Co., com.	150	160
Goodyear Tire & Rubber Co., pfd.	93	95
Gray & Davis, Inc., pfd.	90	87
International Motor Co., com.	5	1
International Motor Co., pfd.	15	8
Kelly-Springfield Tire Co., com.	112	114
Kelly-Springfield Tire Co., 1st pfd.	83	85
Kelly-Springfield Tire Co., 2nd pfd.	118	125
Maxwell Motor Co., com.	8	30
Maxwell Motor Co., 1st pfd.	12	13
Maxwell Motor Co., 2nd pfd.	33	34
Miller Rubber Co., com.	185	170
Miller Rubber Co., pfd.	101	103
Packard Motor Car Co., com.	10	116
Packard Motor Car Co., pfd.	85	98
Peerless Motor Car Co., com.	20	30
Peerless Motor Car Co., pfd.	80	55
Portage Rubber Co., com.	35	34
Portage Rubber Co., pfd.	90	85
Reo Motor Truck Co., com.	8	8
Reo Motor Truck Co., pfd.	18	11
Stewart-Warner Speed. Corp., com.	56	57
Stewart-Warner Speed. Corp., pfd.	100	101
Studebaker Corp., com.	28	29
Studebaker Corp., pfd.	83	85
Swinehart Tire & Rubber Co.	69	70
U. S. Rubber Co., com.	81	81
U. S. Rubber Co., pfd.	102	103
Willis-Overland Co., com.	64	67
Willis-Overland Co., pfd.	91	96

*Par value, \$10; all others, \$100.



* Indicates sanctioned by A. A. A.

Mar. 23-28, Phoenix, Ariz.—Automobile-Architectural-Industrial Exposition; Armory.

April 4, Los Angeles, Cal.—Track meet.

April 20-22, Oklahoma City, Okla.—Road race, S. W. Auto Racing Assn.*

April 30-May 1 and 2, Portland, Ore.—Track meet.

May 8, Salem, Ore.—Track meet.

May 15-16, Vancouver, Wash.—Track meet.

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 23, Centralia, Wash.—Track meet, Centralia-Chehalis.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.*

May 29-30, Seattle, Wash.—Track meet.

June 9, Galesburg, Ill.—Galesburg District Fair Association's 200-mile race.

June 19, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Assn.*

June 25, Sioux City, Ia.—Track meet.

July 3, Sioux City, Ia.—Speedway, 300-mile race, Speedway Assn.*

July 4, Oshkosh, Wis.—Track meet.

July 4, Visalia, Cal.—Road race.

July 4, Tacoma, Wash.—Speedway races, Speedway Assn.*

July 5, Omaha, Neb.—Speedway races, Omaha Motor Speedway.*

July 9, Burlington, Ia.—100-mile track race, Tri-State Fair Assn.

July 31, Denver, Col.—Road race. Promoter, Chas. L. Newcomb, Jr.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 14, Janesville, Wis.—Track meet, Janesville Park Assn.

Aug. 20-21, Elgin, Ill.—Road races, Chicago Auto Club.

Sept. 6, Detroit, Mich.—Speedway races, Detroit Speedway Club.

Sept. 6, Providence, R. I.—Speedway races, Promoter, F. E. Perkins.

Sept. 8, Kalamazoo, Mich.—100-mile track race, Kalamazoo Motor Speedway.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

Oct. 1-2, Trenton, N. J.—Track meet, Interstate Fair.

THE SHOW CIRCUIT

Mar. 22-27, Bangor, Me.—Automobile show, Auditorium; A. P. Pierce, manager.

Mar. 22-27, Springfield, Mass.—Show; J. H. Graham.

Mar. 24-27, Oil City, Pa.—Show; New Armory.

Mar. 25-27, Mason City, Ia.—Spring Opening Automobile Show; Armory.

Mar. 30-April 2, Johnstown, Pa.—Show; Auditorium.

Apr. 5-10, Du Bois, Pa.—Show; Moose Hall.

Apr. 12-17, Paterson, N. J.—Show; Auditorium; Robert A. Mitchell, director.

Champion

"Toledo Made for the Whole World's Trade"



**CHAMPION
TWO-PIECE
HEAVY STONE**
all sizes
Price \$1.25
For High Powered
Automobiles,
Trucks and
Stationary Engines



**CHAMPION
X**
Special
1/2 inch
Price 75c
Factory Equip-
ment on FORD
cars since 1911

ANNOUNCEMENT! **1915** **Profit Sharing Agreement** **For** **DEALERS**

WE believe that the dealer is the natural distributor of Spark Plugs to the actual user.

WE believe that the Dealer cannot afford to sell an inferior product, or imitation.

WE believe that the manufacturer should create a **demand** through extensive advertising in the general and class mediums, and furnish dealer helps.

WE believe that the dealer who sells the **most** should make the **largest** profit.

WE believe that in giving the dealers an extra profit we will get an extra sales effort, and thereby increase our output from 26,000 to 50,000 or more Champion Spark Plugs **every** working day.

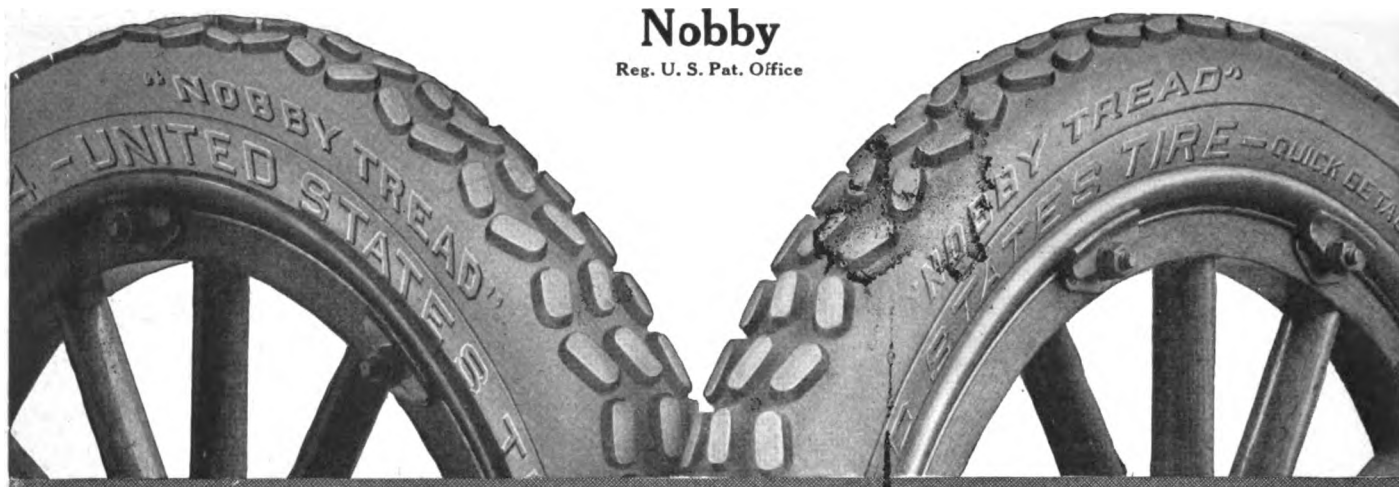
80% of the entire American car output is Champion equipped. Every dealer should get his share of the tremendous resale.

All extra profit is paid to you by check direct from us. Make your check for 1915 a **BIG ONE**. We will help you.

Send immediately for the Champion Profit Sharing agreement for 1915 and secure the extra profit on the Spark Plugs you sold since Jan. 1st, 1915. Application blanks can be obtained either through your jobber or direct.

WIRE or WRITE Us Now

CHAMPION SPARK PLUG CO.
Toledo, Ohio



Nobby

Reg. U. S. Pat. Office

Cheapest Tire Service

Your tires cost you just exactly what they cost you per mile of wear.

The first cost of a tire is a reliable guide only when it adds up enough real mileage wear in the end.

Find out the exact cost of your tire service, and then you will know the truth about real tire economy.

Today the majority of serious automobile owners understand this—that is why they are buying “Nobby Treads”—that is why “Nobby Treads” are called

Business Basis Tires

And remember this—investigations prove that with “Nobby Tread” Tires punctures are 90% less than with the average tire.

Today “Nobby Tread” Tires are the largest selling high-grade anti-skid tires in the world.

Based upon their remarkable mileage records

“Nobby Tread” Tires

are now sold under our regular warranty—perfect workmanship and material—BUT any adjustments are on a basis of

5,000 Miles

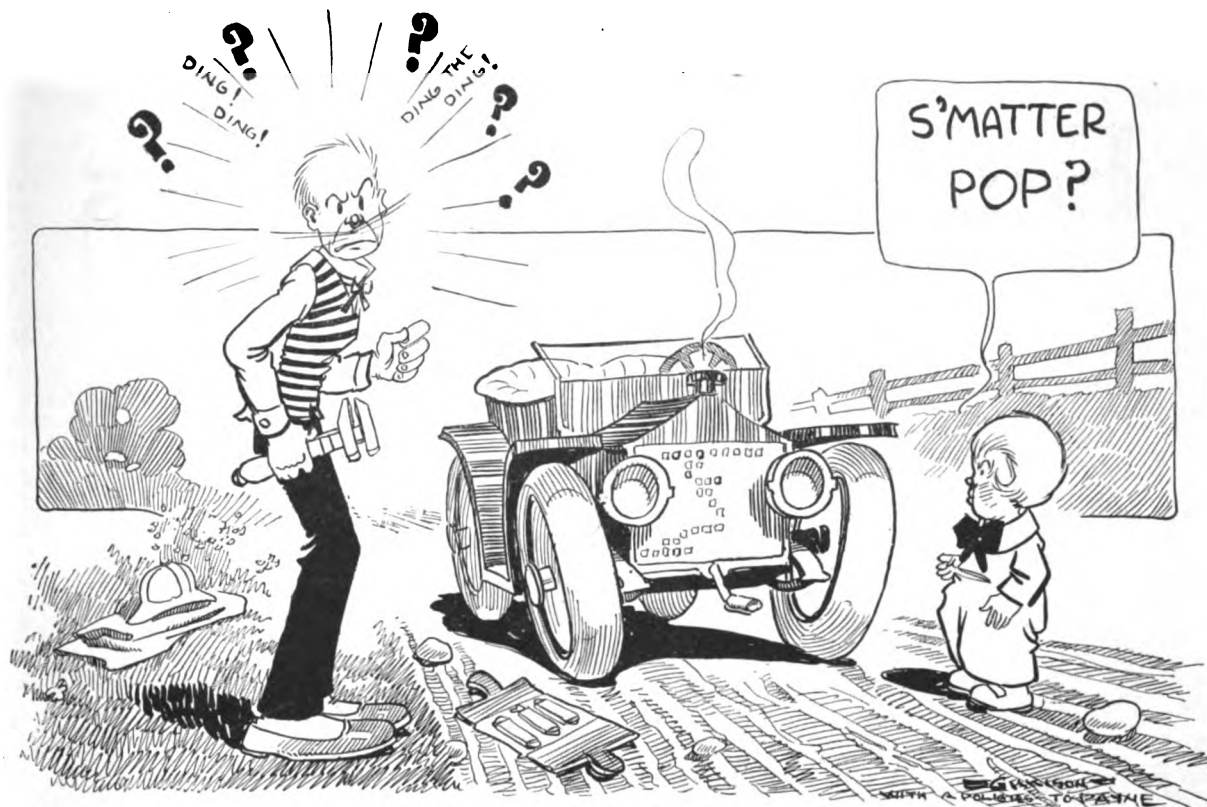
Thousands upon thousands of veteran motorists now use “Nobby Tread” Tires on their front and rear wheels through all seasons, because they give real anti-skid protection and the lowest cost per mile.



United States Tire Company

NOTE THIS:—Dealers who sell UNITED STATES TIRES sell the best of everything.

When writing advertisers please mention Motor World



What's the Use—

of wasting time, breath and disposition on an unresponsive "juice box" that can't understand your non-technical abuse? It's like talking logic to a child.

A storage battery isn't human. If it were it might not stand for the treatment some people give it.

Just three simple things are necessary for dependable battery performance—first of all, a Willard Battery; second, careful attention on the part of the user (which means plenty of pure water and an occasional hydrometer test); and last, a Willard Service Station where battery troubles are put in the hands of experts.

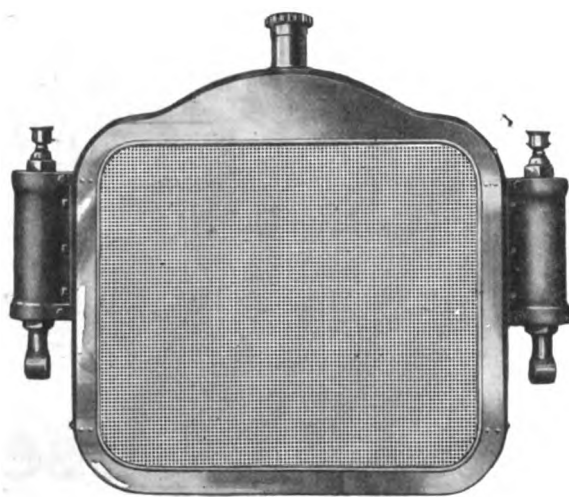
These things aren't luxuries—they're necessities. 85% of American makers of electrically equipped cars have protected themselves by using Willard Batteries.

Willard Storage Battery Company Cleveland, Ohio

NEW YORK: 228-30 W. 58th St. DETROIT: 736-38-40 Woodward Ave.
CHICAGO: 2524-30 S. Wabash Ave. SAN FRANCISCO: 821 Monadnock Bldg.
INDIANAPOLIS: 318 North Illinois Street
SERVICE STATIONS IN ALL PRINCIPAL CITIES IN THE UNITED STATES, CANADA AND MEXICO



Fedders Radiators



One of the largest makers
of motor trucks in the
world has been a con-
sistent user of Fedders
Radiators for years.

Fedders Mfg. Co., Inc.

Buffalo - - - - New York

When writing advertisers please mention Motor World

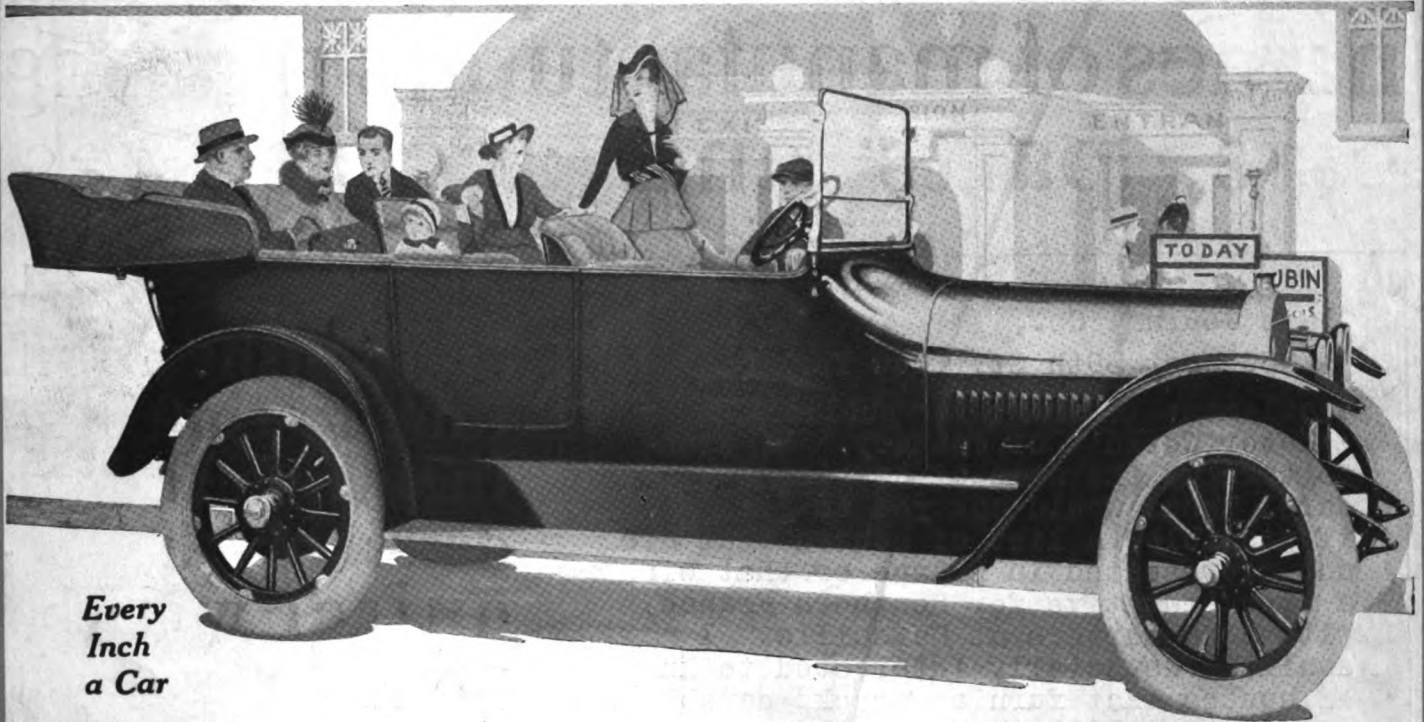
MOTOR WORLD

The Dealers' National Weekly

Volume XLII
No. 13

New York, March 31, 1915

Ten cents a copy
Two dollars a year



*Every
Inch
a Car*

Think This Over—Mr. Dealer

LESS than a year ago Kissel introduced the one-compartment touring car. You know how widely that design has been imitated in some of all of its features—its divided front seats—its two doors instead of four—and other characteristics.

Kissel again came in a year ahead with the ALL-YEAR Car—the first successful combination of open touring car and detachable top. This clever idea is a substantial success—the best selling feature possessed by any automobile on the market.

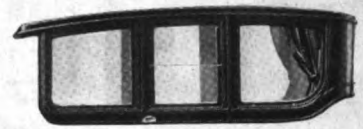
KISSELKAR

Kissel was the first with the "one man" top; first, too, with an arched frame over the front axle; first, also, to use selective type of transmission and full-floating rear axle in a medium priced car. These facts mean much to you if you are looking for the line that will make you the most money. The KisselKar has always presented valuable **exclusive features**—is still presenting them—and can be depended upon to keep a step ahead in the future. The new models—the 36-Four at \$1450 and the 42-Six at \$1650—are far-and-away the best values mechanically of any cars you will find—as well as handsome, individual and exclusive in details of design.

Better be a Kissel dealer—Write for proposition

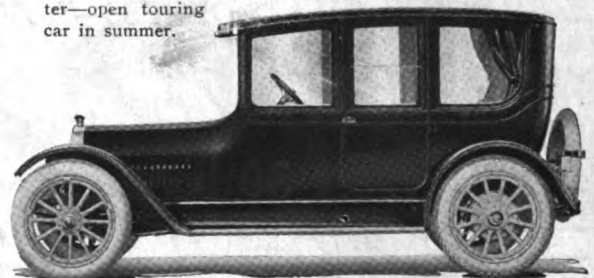
Kissel Motor Car Company, 159 Kissel Ave., Hartford, Wis.

THE ALL-YEAR CAR



The Detachable Top

Closed car in winter—open touring car in summer.



TO THE TRADE

Very often we receive letters from our subscribers requesting the names of manufacturers making cars, parts and accessories.

Class Journal Co.,

239 West 39th St., New York City

Gentlemen:--I have your publication "Motor World" of January. I wish to take up the sale of American cars, hence would ask you to give me, if possible, a list of houses that are not represented in France or that wish a representative for Southern France, with headquarters at Marseille. I shall be especially interested to know of houses that furnish trucks capable of carrying 1000 to 2500 kilograms (2200 to 5500 pounds) net load.

If necessary I can give references and bank guarantees.

Also kindly state where I can find your publication in France.

Hoping to hear from you, I remain

Very truly yours,

(Signed) Name on Request.

These letters will be published from time to time and the name and address of the inquirer will be mailed on request.

This letter from a dealer asking for pleasure car and truck agency for southern France, his bank references are ready—

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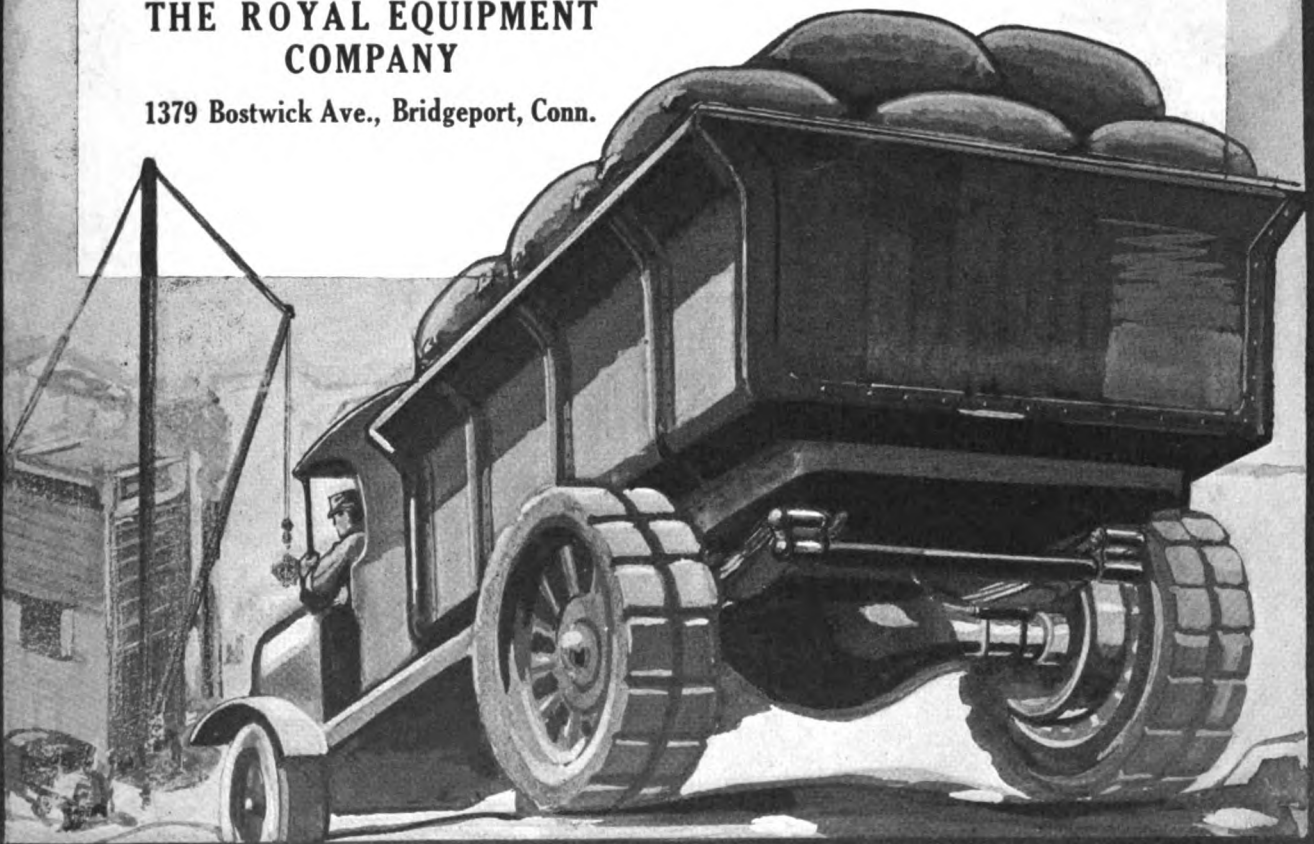
Here is a field in which conditions ordinarily place a burden on the brake lining far in excess of any burden it might be called upon to sustain in pleasure car usage.

In their business affairs, men weigh the relation between price and service more carefully than in their private affairs, and they check up their judgment by results.

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American Made for American Trade



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Kelly-Springfield Tires Now Sold on New Adjustment Basis

Hereafter when adjustments are necessary they will be made on the following basis: Plain tread, 5,000 miles; Kant Slip tread, 6,000 miles. In Ford sizes, plain tread, 6,000 miles; Kant Slip tread, 7,500 miles.

The word "adjustment," however, rarely figures in Kelly-Springfield speech or correspondence. In 1914 the total adjustments on Kelly-Springfield Tires for the whole United States were less than **one per cent** of sales. You get your tire service in uninterrupted mileage—not in adjustments.

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Send to 229 West 57th
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A Great Record

AN Overland Model 81 roadster made a remarkable record against the world's most powerful racing cars in the Grand Prix and Vanderbilt Cup Races.

The Overland was the smallest car in either event.

It finished seventh among 33 entries in the Grand Prix. Not a stop was made because of mechanical troubles.

It was the only one of 35 cars to make a clean non-stop record in the Vanderbilt.

It was the only one of 35 cars to complete the 300 miles in absolutely perfect condition.

We do not encourage racing. We have never built a car essentially for speed.

Yet Overland dealers have repeatedly won hotly contested speed events with stock cars.

This fact speaks worlds for Overland reliability and endurance.

"Made in U. S. A."

The Willys-Overland Company, Toledo, Ohio

MOTOR WORLD

Vol. XLII

New York, U. S. A., Wednesday, March 31, 1915

No. 13

Home-Made Tube System \$100

Quick Transmission Between Floors Afforded

THE advantages of the pneumatic tube system for garages are many, but generally the cost is the stumbling block. Yet the service manager of the C. T. Silver Motor Co., New York Overland and Peerless distributor, has solved this difficulty by installing a home-made system which cost something less than \$100 complete.

Time a Big Factor

Time was wasted in transmitting orders by stairway from the first floor, which is a garage, and the third and fourth floors, which comprise the service station for Overland and Peerless cars; a quicker method was desired, yet the ordinary pneumatic tube, costing about \$300, was deemed too expensive.

The result, after some thought and a little ingenuity, is shown diagrammatically in Fig. 1. The tubes are made of seamless steel tubing, and the carriers, which are of leather, are driven up by compressed air and are returned by gravity.

When it is desired to send a note from the first floor to the office on the third, the carrier

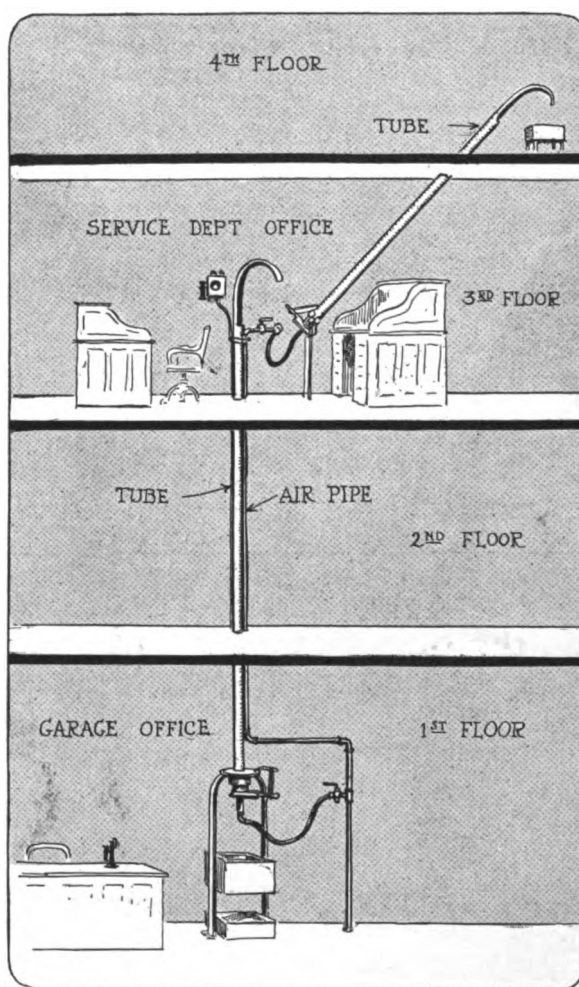


Fig. 1—The tubes lead vertically from the first floor to the third; to the fourth floor the tube is slanting. Carriers are forced up by compressed air from the tire inflation tanks and return by gravity

Diameter of Tubing.....	3 inches
Thickness of Tubing.....	1/16-inch
Cost of Tubing, per foot.....	36 cents
Leather Carrier.....	8 x 2 7/8 inches
Cost of Carrier, about.....	\$1.00
Air Pressure used, lbs.....	90-110

Air for Tire Inflation Used for Power in Tubes

containing the note is placed in the tube, the breech closed and the compressed air turned on; the carrier is shot up to the third floor. Experience indicates how long it takes the carrier to travel these two floors and the air is shut off accordingly. The tube to the fourth floor is operated similarly.

Tubing Inexpensive

The breech is merely a hinged valve, Fig. 2, clamped to the end of the tube and having a leather face to make it reasonably air tight. Compressed air is introduced through a hole in the center of this valve and a hose connects this opening with the air supply. The air supply is the ordinary compressed air used for various purposes throughout the building and the pressure varies from 90 to 110 pounds.

When the breech is not in use it is held partly closed by a wire latch so that it will catch any carriers that are dropped down the tube.

The tubing is 3 inches in diameter, is light, and can be bought for about 36 cents per foot. This is the greatest ex-

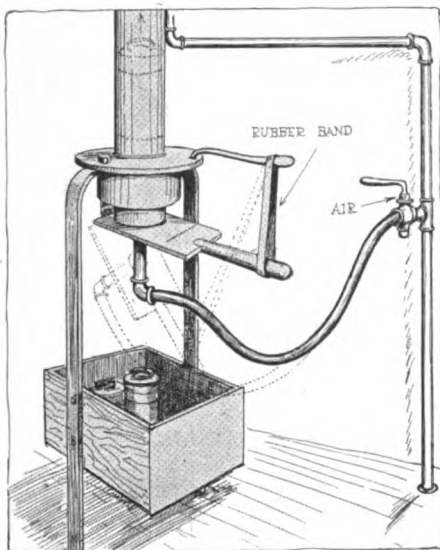


Fig. 2—The tube is closed by a home-made valve held in place with a rubber band; the compressed air is let in through the center

pense in making the installation. The upper end of each tube has been cut in half and bent in a semicircle as shown in Fig. 3. The bending was done cold. By this arrangement the carrier is delivered into a basket, and the semicircle also aids in slowing down the carrier.

The carrier is made of heavy leather and is clearly shown in Fig. 3. Its length is 8 inches and the diameter of the lower end is $2\frac{7}{8}$ inches. Such a carrier can be made by any harness maker at little expense.

The system has now been in use for about six months, and it is estimated that in this time it has paid for itself several times over. On a fairly busy day the tubes are in almost constant use—sometimes several messages a minute are shot to the upper floors and as many make the return trip, says F. L. Thorpe, service manager, who installed the system.

The length of time it requires for the carrier to make the trip between any two floors is almost too small to measure, hence the quantity of compressed air that is used is of small moment. Allowing a workman two minutes in which to walk up, and, say, one and one-half minutes to walk down again, there is a clear saving of three and one-half minutes on every message that is transmitted. Where workmen are required to carry the messages back and forth, this, of course, takes them from their regular work, and, though the actual loss of time would be small in one or two instances, it quickly mounts up into hours when the process is repeated many times in every hour.

Although the system as it has been worked out in the Silver service station solves the message transmitting problem between floors, there would seem no real reason why such a system should not be extended to work well over five or

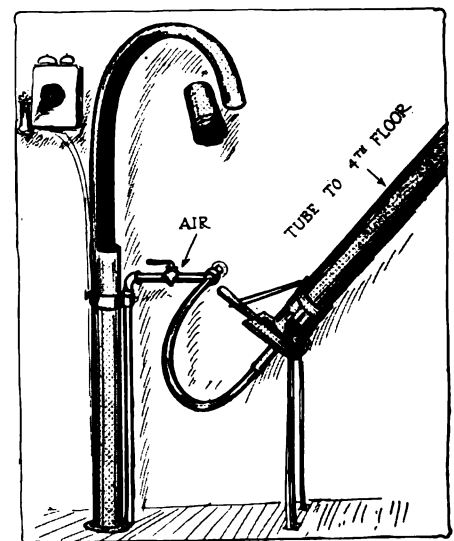
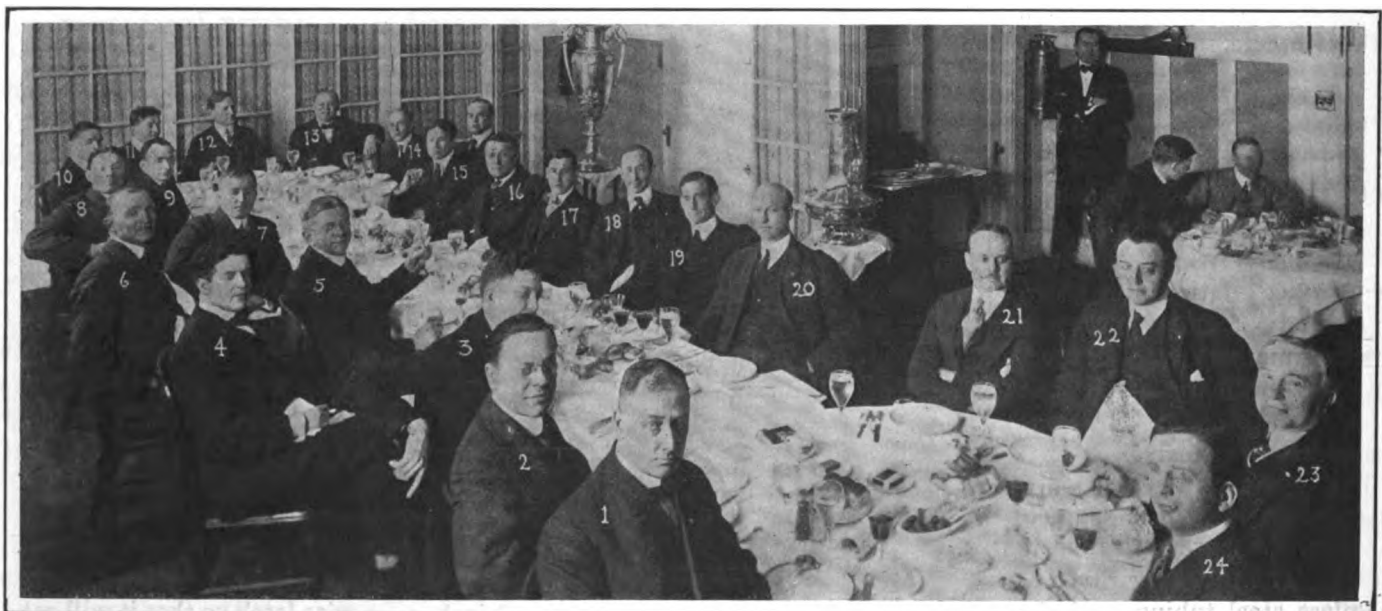


Fig. 3—The upper end of the tube is cut and bent in a semicircle to catch the carriers; the tube to the fourth floor is slanting

six floors. Conversely, it might be made to work quite as well in a smaller garage, though naturally there will be limitations in size below which it will not be advisable to go.

In the case of a very long garage, however, where the office is located at the front and it is necessary to transmit a great number of orders to the shop located at the extreme other end, it might be profitable to work out such a system. In this case it would be necessary to force the carriers both ways with air.

THERMOID DINES RESTA IN HONOR OF HIS VICTORIES IN GRAND PRIZE AND VANDERBILT



Dario Resta's visit to Chicago last week was made the occasion of a luncheon in honor of his winning the Vanderbilt and Grand Prize races. It was given by J. E. Duffield, western manager of the Thermoid Rubber Co. Those present were: 1—F. W. Jencks, manager, Elgin Automobile Road Racing Assn. 2—J. W. Maguire, Republic Rubber Co. 3—Reed L. Parker, Chicago Tribune.

4—Allan Rankin, Chicago Herald. 5—L. A. Hillman, Hess-Bright company. 6—W. J. Boone, Moline Automobile Co. 7—G. F. Ballou, secretary, Chicago Automobile Club.

8—Paul Frank, Chicago Daily News. 9—J. C. Barton, Motor Age. 10—D. Resta. 11—J. E. Duffield, Thermoid Rubber Co. 12—Ed. Westlake, Chicago Evening Post. 13—Chas. Erbstein.

14—John Keicher. 15—Sidney Smith. 16—Dr. Duff, Contest Committee, C. A. C. 17—D. S. Hatch, Motor Age. 18—John De Long.

19—O. B. Duncan. 20—Charles Hatch. 21—E. A. Turner, Technical Committee, C. A. C. 22—F. E. Edwards, manager, Chicago Speedway Assn. 23—J. I. Brown, president, C. A. C. 24—A. J. Hill, Peugeot Auto Import Co.

Ninety-three Iowa Dealers Make Wishes for Future

There Are 14 Different Things They Say Manufacturers Might Do to Help Along a Better Retailing Condition

IF your fairy godmother were to appear through the floor of your salesroom and say that you could have one wish for the improvement of the relations between the dealer and the manufacturer, what would you wish?

What do you regard as the one point in this relationship which is in greatest need of a remedy?

Of course, it probably depends a whole lot on where you are located and a whole lot upon conditions which may be peculiar to your locality or state, and, recognizing this fact, Motor World has just asked the question of a list of dealers in Iowa and the replies are variant, as is shown in an accompanying table.

Uppermost is the question of price and price-cutting; next are those of the curbstome dealer and the shipping of cars to the dealer during the winter months. Questions of commissions are nearly as important, and the mail-order house comes in for a good share of attention, since this western territory is one in which the midwestern catalog houses are strong.

While not leading in number of times mentioned, there seems a sentiment in favor of the elimination of jobbers and big distributors of factory products. An excellent point well taken is that of season models, those who touch upon it seeming in favor of a yearly output which begins about January 1, or at the time of the New York show, thus making the summer an unbroken selling season.

Some of the dealers are in favor of discontinuing the present deposit system on car orders; a closer alliance between the factory and the car after it is sold is advocated by others.

As to the price and price-cutting question there is a sentiment against the price-cutter and in favor of price maintenance of some form. Here are some of the comments:

Opposed to Price-cutting

Don't give price-cutters any goods—Hospers Auto Co., Hospers.

If the dealer cuts prices he should lose the agency; all cutting should be done by the manufacturer—Peter T. Brown, Huxley.

Manufacturer should put his product out to be sold at a given price; not sell to cut-price dealers—Aubry Motor Co., Perry.

Let the manufacturer cut the price instead of asking the dealer to cut it—Whitaker Implement & Harness Co., Red Oak.

Make one price, and the first one to cut it be left out—A. M. Gulick, Sloan.

Better protection of territory and prices—Whyte Auto Co., Goldfield.

Would suggest fixed list prices and more care being taken that the maker sell to dealers only—Salyers & Kayton, Malvern.

Publishing cut-throat prices to everyone having a car is the great trouble—Jenks & Son, Prairie City.

Let the manufacturer and the dealer have the same price to the customer—Craig & Kibler, Stanhope.

A great many manufacturers send net prices to car owners; this should not be done—R. N. Daniel, Glenwood.

Standard prices to all—Motor Inn, Emmetsburg.

Establish among dealers a price on standard articles—W. A. Chauncey, Dunlap.

Dealer to set price on cars—Leech, Gruwell & Co., West Branch.

This latter suggestion may seem radical, but it is not entirely original, for it has been made by others as a remedy for the price-cutting situation. Without a list price there would be nothing to cut, but it is problematical as to how many dealers and manufacturers would give serious consideration to such a plan.

Winter Shipments a Burden

Here's what they had to say about requiring the dealer to take shipments of cars in the winter:

Think the manufacturer should not compel the dealer to take so many cars in the winter without allowing for interest—W. S. & A. V. Blackford, Bonaparte.

I would suggest that the manufacturer sell his product during the dull months on terms of 60 or 90 days or carry his own stock and risk during these months—C. J. Thoreson, Ellsworth.

I am not in favor of winter shipments of unreasonable amounts of cars—B. M. Sweltzer, Hudson.

The manufacturer instead of the dealer should carry the stock of cars—Hawkeye Auto & Supply Co., Hawkeye.

Release the retail dealer from being the holding company during the winter months—L. L. Bybee & Co., Knoxville.

Automobile dealers should not insist on subdealers contracting for so many cars. We should buy cars on spring terms—Columbus City Auto Co., Columbus City, R. S. Johnston.

The manufacturer should carry part of the schedule during the winter months when cars move slow—H. W. Meier Auto Co., Long Grove.

The manufacturer should either carry part of the paper or deposit money to do business on as — and — are doing—E. S. Erdice, Keota.

More commissions and not require dealers to stock so many cars through the winter—Nora Springs Motor Co., A. W. Roberts, manager, Nora Springs.

The manufacturer should help carry part of the winter surplus of cars—England Auto Co., Van Meter.

The worst thing the dealer has to contend with is that the distributor gives a commission contract and then compels the dealer to take and pay for cars out of season without any compensation. They should allow an additional discount for out-of-season deals or in some way pay the dealer for the use of his money—Wise Auto Co., Villisca.

We would suggest that the dealer be given 60 or 90 days' credit the same as is done in other lines of business of like order—Hulsebus Motor Co., Harlan.

Fight the Curbstone Dealer

And then, touching upon the dealer who has no salesroom or garage, who is able to cut prices because of no overhead and who is known as a curbstome dealer, the comments are:

Let all manufacturers do away with the curbstome dealer—Charlotte Auto Co., Charlotte.

Protect dealers who maintain places of business and who are equipped for the business—E. P. Armknecht, Donnellson.

Do not allow any one but a bona fide dealer to handle the manufacturer's goods—J. W. Bancroft, Cedar Falls.

Manufacturers should be more careful and sell only to legitimate dealers—Model Auto Co., Clinton, Ia.

We recommend that manufacturers quote only to fully accredited dealers—Farragut Auto Co., Farragut.

We would suggest that the manufacturer should not sell to anybody except men with capital and a garage where the goods can be properly exhibited and taken care of—Auto Inn Garage, Keokuk.

Manufacturers and jobbers could protect dealers from curbstome merchants—Greene Auto Co., Greene; Floyd J. Neal.

Would like to see the manufacturer and state use their influence in regard to cutting out the curbstoners—A. C. Hanson, McCallsburg.

Cut out the curbstome dealer—Peters Bros., Marcus.

Do not sell cars to any dealer unless

he operates a garage—Melvin Auto Co., Melvin.

Cut out the curbstome dealer—Preston Auto Sales Co., Preston; E. F. W. Schroeder.

Sell only to regular dealers—Parkhurst-Lavender Auto Co., Webster City.

That Commission Question

The commission question was attacked from numerous angles; some of the points are unusual and variant. They follow:

Better discount to big dealers—Denison Auto Co., Denison.

Larger discount to dealer who buys in quantities. If necessary, increase the list—Jackson & Pritchard, Oakland.

Discount to small dealers should be more, to enable him to spend more time and effort on sales—W. R. Davidson, Keosauqua.

Greater discount on one car for demonstrating—Parsons Auto Co., Carnarvon.

Any dealer or repairman should be entitled to a discount on any make of car—Archer Auto Co., Archer.

Readjustment of prices, so cars could be sold f. o. b. destination instead of f. o. b. factory—West Broadway Garage, K. A. Pullen, Onawa.

The manufacturer should allow a reasonable commission on repair parts to the dealer; many manufacturers do not do this—J. C. Fangmann, New Vienna Auto & Supply Co., New Vienna.

Protection to the dealer who buys the bulk of the product—V. A. Dunn, Kingsley.

Larger commissions—Selby-Lyle Co., Guthrie Center.

Better commissions—Barry Bros., Danbury.

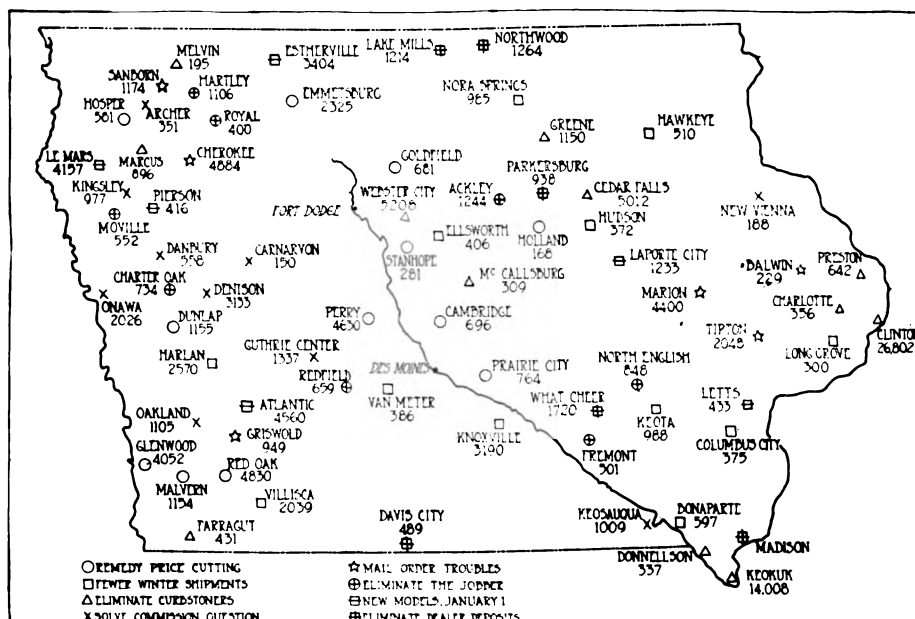
Mail Order House Hurts Trade

The western country is the mail order house's greatest field, and the competition is felt keenly by many dealers. As to the manufacturer's part in this the dealers said:

Cheaper grades of a high-grade product should not be sold to mail order houses—Lawrey, Metter & Pelton, Cheokee.

Sell dealers at the same price as catalog houses—J. W. Rhodes, Baldwin.

THE IOWA TOWNS FROM WHICH CAME THE SUGGESTIONS



The troubles mentioned by the dealers are not confined to any one area. The extent is general. The key on the map shows the suggestion which came from each town

Manufacturers should not market their goods through mail order houses—Griswold Machine & Auto Co., Griswold.

I think something must be done to stop these mail order houses or the garageman will have to drop the accessory business. The manufacturer kicks because the garagemen do not take hold of their products and claim they are forced to put it in the hands of the mail order houses. When a salesman comes to me with some article that looks good I manage to get away from him long enough to look over several mail order catalogs, and if I find his article listed in any of them I turn him down. I cannot sell goods as cheap as they can and live. They get their money with the order; I have to wait 30, 60 or 90 days and sometimes longer. The people ordering the goods from a mail order house never figure in freight, money order or anything. They figure they are getting everything at the price quoted—J. L. Ingram, Marion Garage, Marion.

The manufacturer should not sell the mail order houses—Odebolt Auto & Supply Co., Odebolt; also A. F. Schummer,

Rock Valley, and the Tipton Auto Supply & Machine Shop, Tipton.

Manufacturer should sell goods direct to the dealer so the latter can meet the mail order prices—Jones Bros. Auto Co., Toledo.

I believe it would be better if the manufacturer made it a policy to discontinue cataloging the consumer, as some of them do, and helped the dealer keep a fresh stock of only such accessories as are salable and a necessity—Charley N. Hoffa, Sanborn.

Eliminate the Middleman

Whether it would be possible for the manufacturer to eliminate the jobber of accessories and the distributor of cars is a problem, but there is a sentiment in favor of the move, as follows:

Cut out the jobber—Carson & Co., North English.

Manufacturers should sell direct; that is, cars; some cars have to go through four middlemen. The last dealer has all the work, trouble and collections—L. J. Hjelm, Royal.

The distributor is the man who is making the most from the automobile business and furnishes none of the service. His commissions should be cut—Southwick & Maxfield, Moville.

Cut out the so-called distributor, who adds no value, and give the distributor's profit to the dealer or consumer—Johnson & Messer, Hartley.

Cut out the state agent—Currier & Githens, Fremont.

Manufacturer should sell direct to dealer only—L. F. Lorenzen, Charter Oak.

The manufacturer should cut out the middleman and sell direct to legitimate dealers only—Blake & Wagner, Ackley.

Wholesale dealers should sell only to retailers—A. E. Smith, Redfield.

New Models in Midwinter

And here is a summary of the attitude as to when new cars should be announced:

WHAT 93 DEALERS WOULD CONSIDER IN IMPROVING DEALER-MANUFACTURER RELATIONS

The Suggestion	Number of Times Made	Per Cent of Total
Remedy price-cutting and discrimination.....	14	15
Not so many winter shipments.....	12	13
Eliminate the curbstome dealer.....	12	13
Solve the commission problem.....	10	10
Help combat mail order houses.....	9	10
Eliminate the jobber.....	8	9
New models January 1.....	7	8
Require no dealer deposits.....	6	6
Stick to guarantee.....	5	5
Get better acquainted.....	5	5
More advertising assistance.....	1	1
Dealers too close together.....	1	1
Manufacturers too independent.....	1	1
Too much graft.....	1	1
No use stating.....	1	1
Total	93	100

Bring out all new models at the New York or Chicago show; about the first of the year instead of anywhere from May 15 to February. In the country our selling season is cut in two by the changing of models in midsummer. The first of the year would suit most country dealers better—McCormick Bros., Letts.

Manufacturers should have the dead season in the winter and announce the new cars after January 1—Cass County Auto Co., Cass; John Wright.

Never get out new models until January 1, for show time, as it kills the best selling season when it gets to the latter part of May or June 1; at that time they all say they will wait till the new model comes out and we cannot usually get the cars until October 1; then they offer the excuse that it is too late to buy—Johnson Auto Co., Atlantic; Albert Johnson.

Manufacturers should hold all new models until December 1 before making announcements, giving dealers a chance to move all cars which might be on hand—Ryder & Kan, Estherville.

Cut out yearly models—F. F. Nicolls, Pierson.

The maker to manufacture more cars during the months of March, April and May—Himmer-Schull Auto Co., Laporte City.

The manufacturer might tell the dealer a little more about what changes are going to be made so the dealer could work accordingly—Ben Nicholson, Le Mars.

Some car manufacturers are not nearly so rigid now in the matter of deposits as they used to be; on this question the dealers said:

Cut the deposit out and meet the dealer on the square; keep the price of cars up and increase commissions if pos-

sible. I would like to see this question of the relations between the manufacturer and dealer discussed and might contribute on the subject myself. It is a question that ought to be discussed to prevent the demoralization of the automobile business—B. Butler, Butler Auto Co., Northwood.

Let the manufacturer place agents by not requiring a deposit—C. B. Ferguson, Parkersburg.

Cut out deposits. Help the dealer to put cars in stock by standing part of the investment—Winnebago Auto Co., Lake Mills.

Should do away with deposits, at least to a certain extent. More consideration should be given the dealers, they knowing best the conditions surrounding the locality in which the dealers live—Auto Supply & Engine Co., Fort Madison.

Select responsible dealers and do away with cash deposits on contracts—Teale Auto Co., Davis City.

I certainly object to furnishing the factory with a deposit to run their business on without interest—F. L. Emery, What Cheer.

There seems to be a sentiment in favor of a closer relationship between the maker and the man who sells the car, especially as applies to the car and parts guarantee; here are some of these opinions:

More liberal replacements; when dealer is willing to give his time the manufacturer ought to do something—J. A. Anderson, Corning.

It would take a very long letter to tell our views; we believe a majority of the makers are far too indifferent about the success of their product after it has left their hands; all they want is carload orders. Their guarantee amounts to nothing—Ridder Auto Co., Klemme.

Manufacturers should abide by their warranty and not put off all the work of repairing cars and paying for defective parts—Kimballton Auto Co., Kimballton.

The manufacturer should take care of the dealer on parts instead of referring him to the parts maker, who is often unknown to the dealer—Delta Garage Co., Delta.

Take better care of guaranteed goods—H. D. Mason, Clear Lake.

Get better acquainted—J. O. Caviness, Packwood.

More loyalty to one another—Auto Sales Co., Nevada.

Manufacturer should write the dealer once a month for suggestions on improving the cars—H. C. Hartwig, Clutier.

Meet us face to face as we have to the man we sell to—Homer E. Hart, Stanwood.

More direct relations—C. E. Harmon, Wyman.

And in some cases the dealer who made suggestions was not in accord with his fellows. The suggestions were different. In this class were:

More assistance in local advertising—Warnock Auto Co., Battle Creek.

We think a good many of the manufacturers are inclined to want their agencies too close together—Lowery Hardware Co., Woodburn.

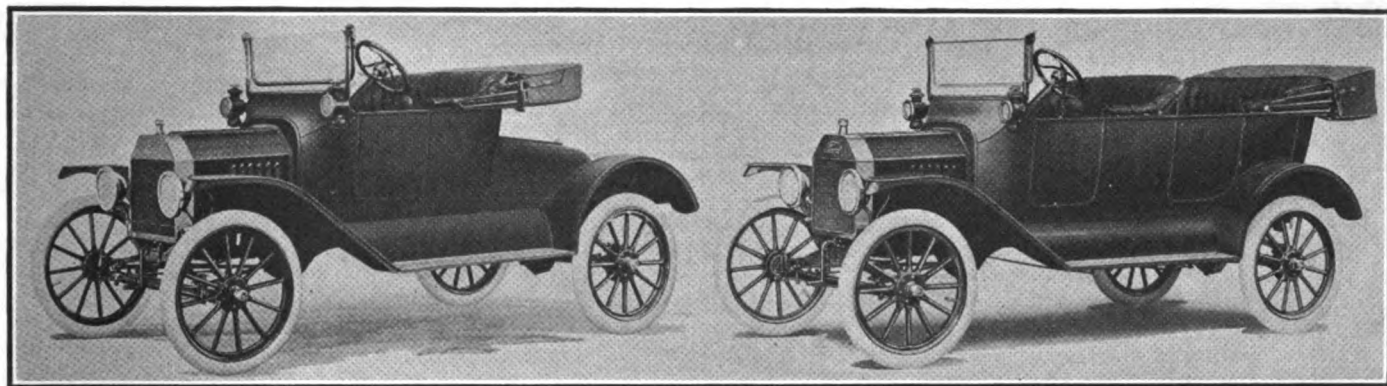
Would suggest that manufacturers use the same business methods as in other lines of business, instead of being as independent as though they were the only persons doing business—Sidwell Motor Co., Iowa City.

That they conduct business on the same principles that are employed in other lines; at present the automobile business is half graft—Cambler Bros., Orange City.

No use stating—John W. Hall, Clinton.

Electric Headlights Among Features of Latest Ford Models

Pressed Steel Dash, Curved Rear Fenders and Hood Louvres Adopted—Prices Unaltered



The new Ford bodies have more pleasing lines, brought about through the adoption of a pressed steel dash and rear fenders which fit around the wheels; electric headlamps are standard equipment

DETROIT, March 30—Although the Ford Motor Co. has been supplying its new type of roadster, touring car and town car models for a little over a month, no announcement of the new models has been given out until today. The shipment of these is now quite general to dealers and branches. Changes are principally in the body and appearance, the model T chassis adhering to standard Ford practice except that the flywheel magneto has been somewhat enlarged to take care of the lighting of the electric headlamps, which

now are standard equipment. Control of the lamps is through a dash switch. The side and tail lamps are oil-burning but of new form. They are more compact and better conform to the body lines.

The most noticeable change is the incorporation of a pressed steel dash in place of a flat wood type. The switches and other apparatus are placed under a cowl on the dash. Other improvements are in the windshield, which is a stronger and more compact type to fit the cowl, and

louvres in the hood to give better ventilation to the engine.

Another noticeable change is in the rear mudguards, which now conform to the curve of the wheels instead of running straight back horizontally from the point of greatest height. The guards are heavier than the former ones, and their form admits of better bracing against rattle.

There is no change in the prices of either model, the roadster listing at \$440, the touring car at \$490, and the town car at \$690.

Kansas City Deliveries Increase 64%

Farmers in Missouri, Kansas and Oklahoma Taking More Cars Than Ever—Fine-combing of Five States for Horses Brings Heavy Truck Demand

KANSAS CITY, MO., March 30—The answer is coming every day to the standing question in the automobile industry as to just what bearing the enormous wheat crop of 1914, with its war prices, will have on the sale of cars in the big grain states of the Mississippi valley. With the first three months of 1915 gone, it is possible to arrive at conclusions based on actual figures.

Alarmists have freely predicted that the farmers, to whom the bulk of the low and popular priced cars have been going, would quickly come to the end of their rope as the result of such a huge investment in a so-called luxury. They pointed to the fact that Kansas—always a weather vane in the grain states—had on January 1 of this year 50,454 motor cars, representing a total investment estimated at \$40,363,200. This allows an average price of \$800 to the car, which appears conservative when it is figured that of the 15,000 Fords in the state many were bought at a higher price than prevails this year on the same make.

Farmer Buying More Cars

These men asserted that this money should have gone into wealth-producing investments, although the farmer gets 10 per cent pleasure out of his car and 90 per cent business where the average city man just reverses the proposition. However, what the motor car returns to the farmer on the investment is another story. The distribution of cars indicates that the farmer is buying cars more heavily this year than ever, instead of using his wheat money to pay debts brought on in the past in this so-called motor dissipation.

To get quickly to the point, the deliveries of low and medium priced cars in the southwest, as shown by the figures of factory branches and distributors in Kansas City, prove an increase of business the first three months of 1915 over the same period of 1914 of 64.2 per cent.

This takes into consideration that conditions in March this year were unusually bad for deliveries. Figures secured from the branches and agencies here, it may be mentioned, represent deliveries, not sales for future deliveries. Differences in territory and changes in territory, besides the closing of some agencies and the opening of others, make it difficult

DO YOU KNOW?

Do you know how many horses the belligerent nations of Europe have purchased for cannon fodder during the past three months?

The returns place the figure at 60,000 from the states of Kansas, Missouri and Oklahoma. The situation is becoming serious for the farmers. Horses are short. So, the farmer is turning to the motor truck and an unprecedented demand—particularly for the lighter models—has sprung up.

This is the second of a series of monthly reports on the great Southwest which **MOTOR WORLD** is publishing. It is written by an expert who for 25 years has been closely in touch with every phase of the situation. He says the grain crop will be a bumper, due to plenty of spring moisture. This means much to the motor car dealer.

to make tabular comparisons. In many instances, too, it was impossible to secure the exact figures on deliveries unless the name of the manufacturer was omitted. In order, therefore, to secure figures without exaggeration, in some instances these names will be withheld. Among the cars represented in arriving at the percentage of increase of business are these:

The Distribution Considered

Ford—Figures on Kansas and western Missouri.
Overland—Kansas, western half of Missouri and northern Oklahoma.
Buick—Kansas, western tier three counties of Missouri.
Studebaker—Kansas, Oklahoma and western half of Missouri.
Maxwell—Kansas, Oklahoma, Arkansas, Louisiana, Texas, New Mexico, Wyoming and western half of Missouri.
Reo—Kansas, Oklahoma and western half of Missouri.
Chevrolet—Kansas, Oklahoma and western half of Missouri.
Chalmers—Thirty-five counties in Kansas and twenty-six in Missouri.
Hudson—Eastern half of Kansas and western half of Missouri.
Jackson—Kansas, Oklahoma and western half of Missouri.
Abbott-Detroit—Missouri, Kansas and northern half of Oklahoma.
Paige-Detroit—Kansas, Oklahoma and western half of Missouri.
Peerless—Kansas and western half of Missouri.
Marmon—Kansas, Oklahoma, western half of Missouri.
Locomobile—Kansas, Oklahoma, Texas and western half of Missouri.
Packard—Kansas, Oklahoma and western half of Missouri.

Pierce-Arrow—Kansas, Oklahoma and western half of Missouri.

This list gives a comprehensive idea of the cars and territory upon which the figures are based. Inasmuch as the low-priced cars and popular-priced cars represent farmer sales more largely and the higher-priced ones city deliveries, the Packard, Marmon, Locomobile, Pierce-Arrow and Peerless have been placed in one group and the popular-priced cars in another.

The Ford deliveries in Kansas and western Missouri the first three months of 1915 are given as 6,000 cars, which represent an increase of 98 per cent. The Ford cars in Kansas number almost 3/10 of all the cars in the state and the percentage will hold fairly well throughout the Mississippi valley.

Studebaker shows a delivery in January, February and March of 488 cars, 52½ per cent increase.

Overland's Figures Interesting

Overland, which has been a popular car in this region, gives some interesting figures:

	1914 Deliveries	1915 Deliveries
January	14	112
February	84	149
March	140	175
Total	238	436

Increase of business on three months, 83 per cent.

Maxwell, with its great range of territory out of Kansas City, shows the delivery of 2,300 cars in three months of 1915, an increase of 500 per cent.

The deliveries of Reo and Chevrolet are combined in figures for 1914 and separated this year because of a change in dealers; but, with a slight change in territory, the increase is estimated at 120 per cent.

Then taking in some of the smaller agencies and some of the others like Buick, which shows an increase of 50 per cent with deliveries held up in one month, the average of increase in business is estimated at 64 per cent. The four largest companies show an increase of 68.7 per cent. While this is an average on percentage, it must be borne in mind that one of these companies does a business in this district estimated at three-fourths of all cars sold. Taking this in view, a really closer estimate

of this increase in business would be 74.2 per cent.

The Marmon, Locomobile, Packard, Peerless and Pierce-Arrow, placed in one group show an increase in the first three months of 1915 of 66.1 per cent over the same period of 1914. This, however, is not a fair average because of the 200 per cent increase of business in the Kansas City branch of the Marmon company. This company in 1914 sold very few cars in this territory. However, last fall with an entire change of representatives at the branch, better results have been achieved. Only one of these cars shows no increase of business while the other three which are the largest sellers of the five high-priced cars mentioned, show an increase of 49 per cent, which represents a steady growth under normal conditions in the salesrooms.

Kansas City Buys Many Trucks

The first three months of 1915 in the deliveries of trucks show a gain of 50 per cent over the first three months of last year. The estimate placed on deliveries in Kansas and the western part of Missouri in the three winter months this year has been \$300,000. Of this number, trucks worth \$65,000 have been delivered in Kansas City.

The winter demand is a new thing here. Usually the truck dealers have settled back for a rest from December to March, but the inquiries commenced coming in this year in December and the sales of January, February and March are 50 per cent greater than any previous year. One dealer has doubled his selling force and has sold 49 trucks, where the same period last year brought only 9 sales. He has been in the business in this city seven years and his conditions are exactly the same, except for the new salesroom.

A new demand is that for 1-ton trucks for jitney buses. However, the call from business concerns and hauling companies has also increased and now the farmers are sending in many inquiries regarding trucks and are buying some for farm use.

Light Truck for Jitney Use

The light truck seems destined to have a great use for inter-city jitney service. The motor bus which can haul passengers and some baggage and light freight is being asked for and it is predicted that regular routes will be established wherever the roads will permit in Missouri, Kansas, Oklahoma, Texas and Nebraska. Twenty-five trucks have been sold for this purpose in the last six weeks and they are growing in favor for city use instead of the rebuilt light pleasure cars.

The demand from the farmers for trucks is practically new. There are a few in use in Kansas and Missouri for hauling feed and for general use about the farm, but quite a number are being

used to replace driving teams. A 1-ton truck hauls the produce to town, and hauls back feed and flour and supplies, and serves as a semi-pleasure vehicle at the same time. The dealers are handling inquiries from the farm with a view of developing this sort of demand.

In accounting for the heavy sales which usher in 1915, Estel Scott, president of the Kansas City Motor Car Dealers Association, assigned several reasons:

One, of course, is the record-breaking crops of last year and the encouraging prospects for another big wheat crop this season. The high price of lead and zinc has made the mining district of Southwest Missouri and Southeast Kansas heavy buyers.

Also, the low price of gasoline and the high price of horse feed, has helped the truck business. In addition to this, a foot of snow that came the first of March demonstrated the superiority of trucks over teams in a trying time.

But greatest of all the influences that is creating a demand for trucks and touring cars as well and just beginning to be felt, is the shortage of horses. A revolution is being worked in the truck business and a few months will see a condition that the motor truck producers have wanted but none dared hope for.

British Heavy Horse Buyers

The British army has been buying liberally of horses in this section since Europe has been at war, and the French have been fairly large purchasers, too, but only the last few days have horse and mule buyers begun to realize what the demand is. A few days ago Thompson & Robinson, horse and mule dealers here, closed a contract with the French government for the immediate delivery of 26,000 head of horses. One day, March 20, forty-seven carloads left Kansas City for New Orleans. A contract is pending with the Belgian government for the delivery of 20,000 head. And if this does not mean sales of trucks and touring cars, listen then to the extremities to which the horse dealers are put to gather horses to fill their orders in Kansas City, the second largest horse and mule market in the world:

When the foreign army officers first began buying horses and mules in this market, they segregated the animals and conditioned them with vaccination and other means. That has been abandoned in the rush. The animals are shipped immediately to New Orleans or Newport News. A fleet of ships is now waiting at Newport News to convey them.

And Missouri, Kansas, Oklahoma, Nebraska, Colorado and the Dakotas, literally combed for horses for the British, are to be fine-combed now to supply the French 26,000 head more. If the pending contract for 20,000 horses for the

Belgian government goes through, the demand will be still more urgent.

Approximately 60,000 horses and mules, valued at \$12,000,000, have been purchased in the states mentioned since September 1 and have been marketed through Kansas City to the British. The desirable cavalry type was soon exhausted and the rule that all horses must be under seven years of age was soon abandoned. Also the price has gone up \$25 to \$35 a head since September.

Not So Particular Now

For more than two months the British have been buying only artillery horses, for which they pay around \$225. The farmer gets from \$160 to \$185 for these animals. The type is the general utility farm horse, weighing from 1,200 to 1,400 pounds, up to 12 years of age, and a wire cut or a small blemish does not disqualify. The smooth-mouthed horse, whose teeth indicate he is over 9 years old, is going now if he has good short teeth.

The British are also buying mules for artillery purposes and are having to pay a little more for them than for the horses.

In getting the horses for the French contract the efforts will be confined to the states already covered by buyers from Kansas City. The other districts of the country have been gone over as thoroughly as this and the scarcity of horses is general.

The Italian government is now vying with the United States government in purchasing young horses. Recently in Grand Island, Neb., the Italian buyers bought a lot of Spaghetis. These are horses 3 and 4 years old, and many of them unbroken. Branded western horses of this age and so wild that they could not be handled except with a lariat, brought \$100 to \$110 apiece.

United States, Too, Buys Horses

The United States army is also buying an exceptionally large number of young, unbroken horses true to type. These are being put on the government ranches at the remount stations. The action of this government is believed by horsemen to mean that the United States army fears a horse famine and is trying to stock up.

The scarcity of draft animals is beginning to be felt in the cities because of a movement to stock up in advance of higher prices. Teams suitable for brewery and packing house wagons are selling as high as \$600.

The month of March has shown improvement in the condition of the winter wheat crop now in the ground. The great winter wheat crop states are Kansas, Nebraska, Oklahoma and Missouri. These states represent 44 per cent of all the winter wheat acreage in the United

(Continued on page 16)

New Jersey Garagemen Organize

Peddling of Gasoline by Private Garages Principal Evil That Will Be Fought—Association Will Hold Court on Complaints of Car Owners

To protect their own interests and the interests of those who store cars with them, 35 garagemen of Newark and East Orange, N. J., have formed the Garage Owners Protective Association of New Jersey; it is planned that eventually the organization shall include the garagemen of the entire state.

The organization, which long has been projected, was formed last week with John H. Wills, proprietor of Wills' Garage, Newark, at its head, other officers elected being: Vice-president, Augustus Winkelhoefer, Standard Garage, East Orange; secretary, Paul F. Devine, Washington Park Garage, Newark; treasurer, W. G. Thacher, Pope-Hartford Garage, Newark.

To Hear Owners' Troubles

The way in which the association will work to protect the interests of garage patrons is unusual. It has been found, according to President Wills, who is the moving spirit in the association's work, that some garagemen, purposely, or without purpose, have in some instances overcharged the customers of other garages who through necessity have been compelled to purchase fuel, oil or accessories on the road. It is proposed to eliminate this evil by the simple expedient of having dissatisfied customers report such matters to the association, which will then investigate the alleged delinquency and where warranted discipline the delinquent. These matters, it is planned, will be brought up before the regular meetings.

But that there will be little work of this kind for the organization to do after it has gotten fully under way, is the opinion of Wills, who points out with a great deal of truth that this evil, and many others, are due largely to the fact that as a general rule the garagemen are unacquainted with each other and therefore are prone to believe that every garageman is out to do his brother.

"The first apparent benefit of the organization, as young as it is, and one that will be lasting," said Wills, "is that it got the boys together. I met Mr. So-and-So, who is my greatest competitor, shook hands with him, and we talked things over. I know now that he has no horns on his head and he knows that I have none on mine. And so it was with many of the others who attended the

first session. They met their brother garagemen for the first time; they found that they are pretty good fellows after all and that it is altogether possible and will prove beneficial to work together."

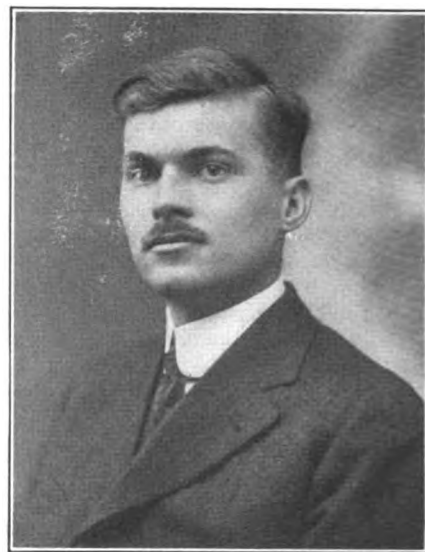
One of the principal evils that has brought the garagemen together is the promiscuous sale of gasoline by persons other than garagemen. Wills points out that though the law expressly prohibits the storage of more than 5 gallons of gasoline in tanks above ground, there are hundreds of embryo merchants in Newark, most of them trading in private houses, who hang out a gasoline shingle and peddle fuel to transients at prices far below those the legitimate garageman must charge because of his overhead. It is planned to abate this evil by having the law rigidly enforced.

At the last meeting the question of curb pumps was discussed, though not all of the members were in favor of installing these devices. At present the law will not permit their use, though a wheel tank of approved form may be used. It is the general feeling that if the statutes were revised to permit the use of curb pumps the situation would not be much improved.

Co-operative Supply Purchases

Another important work which the organization shortly will take up is that of cooperative buying. As it is at present, many of the garages in Newark and the surrounding territory are not large, and because of this are compelled to purchase supplies such as soap, sponges and oil, at prices which are not the best. Under the proposed plan these supplies will be contracted for in bulk and shipped directly from the manufacturer.

At the initial meeting two committees were appointed, one to draw up a constitution and by-laws and the other to select a suitable emblem which, conspicuously displayed on the front of a garage, will make known its membership in the organization. C. Laue, of the Lane Garage, Newark, heads the committee on a constitution and by-laws, and associated with him are the following: Geo. F. Van Winkle, Van's Garage, Newark; Arthur Hellings, Ideal Garage, Newark; Geo. Fischer, Fischer's Garage, Newark; Wm. Moore, Electric Garage, Newark, and S. H. Lockett, North Grove Garage, East Orange.



John H. Wills, president, Garage Owners' Protective Association of New Jersey

The members of the Emblem Committee include: Chairman, Robert Bennett, Summer Avenue Garage, Newark; Henry C. Bauder, Chester Avenue Garage, Newark; Floyd C. Huff, Nassau Garage, East Orange.

One Refiner to Help

At the meeting which was held Monday night, one of the refining companies went on record as being in favor of stopping sales of fuel except to garagemen with properly installed underground tanks. An emblem, consisting of a tired wheel with the name of the association on the tire and a picture of an automobile in the hub was adopted; the colors are blue, red and gold.

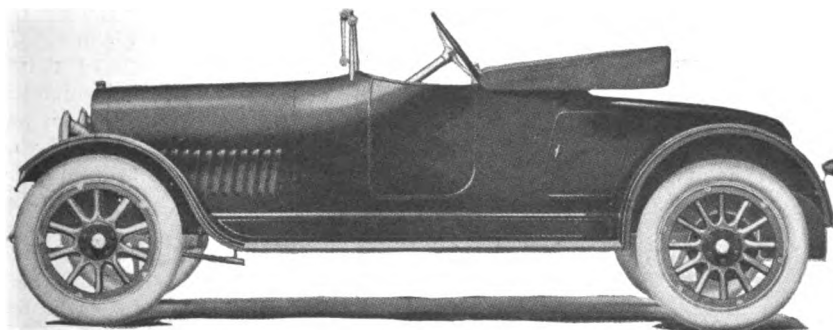
To carry on the co-operative buying plan a committee was appointed to ascertain the needs of the members; this will report at the next meeting, April 6. Two new members were admitted, as follows: Henry Eisenlohr, West End Garage, Newark, and J. B. Taylor, Newark Truck Service Co., Newark.

Those who attended the initial meeting were:

S. H. Lockett, North Grove Garage, East Orange; M. E. Prehm, Hunterton Garage, Newark; Floyd Huff, Nassau Garage, East Orange; H. R. Ball, Ball's Garage, Newark; M. A. Brunner, Brunner's Garage, Newark; A. Winkelhoefer, Standard Garage, East Orange; W. G. Thacher, Pope-Hartford Garage, Newark; C. Lane, Lane Garage, Newark.

Arthur Hellings, Ideal Garage, Newark; Geo. Van Winkle, Van's Garage, Newark; J. V. Lupo, Lupo Garage, Newark; Thos. Cook, Cook's Garage, Newark; Wm. Moore, Electric Garage, Newark; John H. Wills, Wills' Garage, Newark; F. H. Walsh, Walsh Motor Car Co., Newark.

R. D. Edsall, Park Avenue Garage, Newark; O. E. Farley, Farley's Garage, Newark; Mr. Willis, Clinton Garage, Newark; Mr. Walker, Chester Garage, Newark; Mr. Kurbine, Avon Avenue Garage, Newark; Geo. Fischer, Fischer's Garage, Newark; Mr. Jacobus, Edwards-Knight Motor Car Co., East Orange; Gus Hesselthaler, Garden Garage, Newark; Mr. Peterson, Broad Garage, Newark; Mr. Martin, Martin's Garage, Newark; Robert E. Bennett, Summer Avenue Garage, Newark.



In the six-cylinder roadster, the lines are clean and the rear compartment affords ample storage space; side doors are provided

Westcott Line Four Models on Two Chassis

Four at \$1,185 and Six at \$1,585—Roadster Seats
in Clover-Leaf Fashion

Four models on two chassis, a six with either seven-passenger touring or three-passenger roadster bodies at \$1,585, and a four with five-passenger touring or three-passenger roadster at \$1,185, constitute the Westcott line, produced by the Westcott Motor Car Co., Richmond, Ind. These prices include as standard equipment Delco electric lighting and starting, Exide battery of 80 ampere-hour capacity, Golde one-man top with Pantasote covering, Jiffy curtains, double tire carrier at the rear with one extra Firestone demountable rim, Stewart speedometer, rim-wind clock, Klaxet horn, and muffler cut-out.

In the touring bodies the front seats are divided with an aisle between sufficiently wide to make passage back and forth easy; the doors are wide and the arm rests properly positioned for the average man.

The body accessories and the fittings are neat and well placed. There is a tonneau light on the rear of one of the individual chairs and each seat has its own robe rail. The foot rest is about 4 inches wide and is covered with blue cloth to match the floor covering.

In the roadsters the three seats are arranged in clover-leaf fashion. The passengers sit at about the middle of the chassis, the deck in the rear being almost as long as from the radiator to cowl. This deck has an unusual amount of room for carrying tires and spare parts and has side openings as well as one in the rear.

The six-cylinder model employs a unit power plant, driving through a tubular shaft to a spiral-bevel rear axle. The Northway motor used is $3\frac{1}{2} \times 5$, with block cylinders, but having three cylinder heads fastened by studs and nuts. Due to the large amount of room around each unit, access to the various accessories is easy. The starting, lighting

and ignition apparatus is a Delco combination mounted on the right of the motor and driving through the flywheel.

PRINCIPAL WESTCOTT DETAILS

Price—	Four	Six
Touring	\$1,185	\$1,585
Roadster	1,185	1,585
Color	Green or maroon	Green or m'r'n
Make of motor	Northway	Northway
Number of cylinders	Four	Six
How cast	Block	Block
Bore	$3\frac{1}{2}$	$3\frac{1}{2}$
Stroke	5	5
S. A. E. rating	19.6	29.4
Ignition	Delco	Delco
Starting-lighting	Delco	Delco
Carbureter	Schebler	Rayfield
Clutch	Cone	Cone
Gearset	3-speed	3-speed
Wheelbase	113	125
Front tires	33×4	34×4
Rear tires	33×4 non-skid	34×4 non-skid
Wheels	Wood	Wood
Steering	Left	Left
Control	Center	Center
Make rear axle	Weston-Mott	Timken
Type rear axle	Bevel gear	Spiral bevel

Equipment: Golde one-man top with Pantasote covering, Jiffy curtains, double tire carrier, one extra rim, Stewart speedometer, rim-wind clock, Klaxet horn, muffler cut-out and tools.

This unit and the water pump are the only two on that side. The ignition coil is mounted on top of the motor-generator housing.

The left of the engine is free from complications. On this side are the valves, each two cylinders having an individual cover plate, and the hot waterjacketed Rayfield carbureter. The latter is well above the frame line. The carbureter is fed by a Stewart vacuum tank, the main tank, of 20 gallons capacity, being at the rear of the chassis.

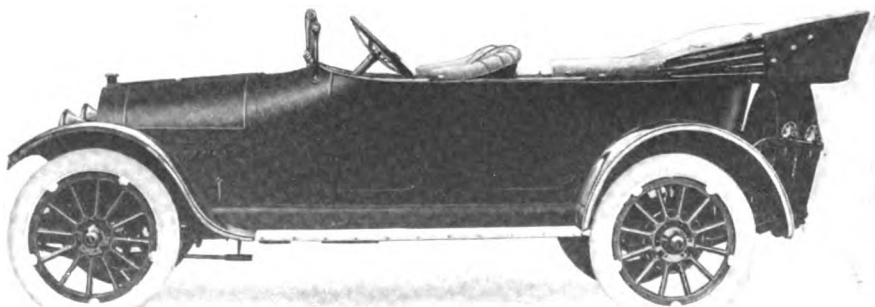
In unit with the motor is a leather-faced cone clutch with spring inserts and this drives a three-speed gearset operated by a control set made by the Warner Gear Co. The tubular propeller shaft is fitted with two Hartford universals. The forward joint has the speedometer driving gear attached.

Continuing further in the drive is the spiral-bevel Timken axle with a gear reduction of 4.08 to 1. The brakes show nothing uncommon to Timken practice. At the outer ends of the axle housing are the seats for 52-inch cantilever springs of eleven leaves each.

The steering is by a post made by the Warner Gear Co., with the conventional linkage to the front wheels. The wheels carry 34×4 Firestone tires, the rear ones being non-skids. All are mounted on Firestone demountable rims. The wheelbase is 125 inches.

The four-cylinder model differs a little from the six. Its wheelbase is 113 inches and while fitted with a Northway block motor of the same dimensions as the six is uses a Schebler carbureter fed the same way as the six. The general arrangement of parts is the same, the right side having the Delco unit and water pump, the shaft of which is extended to drive the fan pulley. The clutch and gearset, while slightly smaller than that gearset, while smaller than in the six, are essentially the same in design.

Two universals are used in the drive, but the propeller shaft in this car is inclosed in a torsion tube. The rear axle, as well as the front, is Weston-Mott, the gears in the former being bevels instead of spiral bevels. The only other differences between the two cars are in the rear springs, which in the four are three-quarter elliptic instead of cantilever, and the tire size, which is 33×4 . Standard body colors are Westcott green or deep maroon.



The four-cylinder touring model has well-blended lines and a smooth exterior; tires are carried at the rear as is the fuel tank

Dealer's Legal Status

Where Territory Is Specifically Stated in an Agreement, Sale Outside This Territory Is Breach of Contract—
Right to Fix Re-sale Prices Not Decided

By George F. Kaiser

Will you kindly tell us if an agent signs a contract to handle a car and in this contract the territory and also prices are put in, could the company do anything if an agent decides to sell cars out of his territory and at a cut price? Is the agent liable for fines and what is the decision of the supreme court? We have been taking Motor World for several years and will appreciate your answering above.

Darlington, S. C. C. W. H. & S.

Let us first consider the matter of a dealer selling cars outside of the territory allotted to him in his contract with the manufacturer. His right to do this, and the results which will follow his doing this, depend, of course, entirely on the clauses and the phraseology of the contract itself.

As regards territorial arrangements in a case where an agent is restricted to certain specified territory, his sales outside of that territory may constitute a breach of contract. Such a sale would clearly be a breach were the usual clause, that agents will refer all inquiries from territory other than their own to the manufacturer, found in the contract.

Dealer's Rights Are Clear

If this other territory in which the sale is made has been allotted to another dealer by the manufacturer, the dealer can sue the manufacturer and collect damages from him because of this fact.

The manufacturer in turn may treat his contract with the offending dealer as broken and keep whatever deposit has been made with him, or in turn sue the dealer for the damages he has suffered.

The right of one dealer to collect damages from a manufacturer for breach of contract, if another dealer sells a motor car in the first dealer's exclusive territory, is clear.

The right of a manufacturer to demand that the offending dealer give up the commission which he is not entitled to, and in event of his being unwilling and refusing to give up the commission to revoke his authority as an agent is also undoubted. This matter is entirely a civil one and, of course, no criminal action can be based on it, nor are there any fines which can be collected from the dealer.

With regard to a dealer's right to cut prices and sell below the fixed retail price which the manufacturer has inserted in the contract, little can be stated with authority. There has been considerable confusion because of decisions of various courts in different states on this point, which seem to be diametrically opposed. Some decisions have held that a manufacturer has the right to fix prices and other decisions again have held that he has not that right.

The matter has never been squarely faced by the Supreme Court of the United States, and until a decision is handed down on this point by that court there will be considerable uncertainty as to how the law stands.

Brought Suit for \$50,000

In a case decided in the United States District Court in Cincinnati some time ago, a complaint of the Ford Motor Co. against the Union Motor Sales Co. of Dayton, which was brought because of the latter's price cutting, was dismissed. The Ford company had declined to sell cars to this company, but the other company had obtained cars and was selling them at less than list price. The suit was brought for \$50,000 damages and an injunction was requested restraining the company from selling any more Ford cars.

"The rights of the parties," ruled the court, "depend upon the construction to be given the written contracts entered into between the Ford Motor Co. and its so-called 'dealer licensees,' and so far no case involving a contract precisely like the agreement between the complainant and the dealers who sell the cars made by it and covered by its patents has been presented to the Supreme Court.

"An agreement by the patentee, giving to another the right to manufacture under the patent and to sell at a fixed price on a small royalty has been held not to come within the jurisdiction of the Sherman anti-trust act. (Bement vs. Harrow Co.)

"It is conceded that contracts such as made by the complainant with its dealers would, were it not for the fact that the article sold was made by the complainant under its patents, be con-

trary to public policy under the decisions in Dr. Miles Chemical Co. vs. Parke. But it is claimed that since the complainant does manufacture its cars under its own patents, it has the right to maintain a monopoly of the exclusive right to sell, granted by the patent laws, by a contract of sale with its dealers, fixing the price on resale at which the dealers may sell to the user, although by so doing the competition between the dealers is thereby effectually prevented.

"There is, however, a marked difference between these contracts and the license contracts to which the Supreme Court has given its approval. For, in this case, the patentee is the maker and does not, in terms at least, receive a royalty, but actually sells each machine at a price fixed by itself and is paid by the dealer all that the maker asks for the article sold. There is no question of restricted use in this case as in that of Henry vs. Dick, for the contract is either a complete sale of the exclusive right to sell given the complainant under the patent laws, or a license to sell, which involves a reservation of some part of the exclusive right to sell, or, as contra-distinguished from these, amounts to a sale.

"For the purpose of this case it may be assumed that if the contract partakes of the quality of a sale of the exclusive right to sell, or of a license to sell, it is a good contract which the complainant may legally enter into with its dealers and, under the facts proved in this case, an injunction must be issued against the defendant.

Definite Rules Yet To Be Made

"But if, under the terms of the contract, the complainant has sold the automobile made by it and delivered the sale to its dealers, passing the title upon the receipt of the contract price, then, under the decisions of the Supreme Court, and on principle, the conclusion in my judgment must be that by such sale the complainant . . . cannot legally fix the price at which the dealer shall resell. The contract does not deal with the use of the automobile sold; hence, to call it a contract for 'restricted sale' is a misnomer, and the adoption of such a definition is, as said by Mr. Justice Day, 'a mere play upon words.' (Bauer vs. O'Donnell)."

Numerous other decisions have been handed down within the past year which show that the tendency of the courts is not to permit manufacturers to fix prices on articles, but until some definite rules have been laid down by the highest court it will be difficult to say whether or not a dealer has the right to cut prices under any form of contract which is different than those which already have been passed upon.

Use the Desk to Write On—Not to Roost On

Looks Pretty Bad, Reilly Tells a Confreere Who Stages an Office Stag Party Late Every Afternoon

By Ray W. Sherman

"HELLO-O-O-O! Reilly-y-y-y!" sang Henry Bennett, Sam McGinn and Joe Ferris in chorus from Joe's desk in the Redman salesrooms, where the trio sat, gently drumming their heels against the side of the desk waiting for the hands of the clock to crawl around to 6 P. M. At that hour the day's work would be considered done. "Howdy, boys," was the little, bald-pated dealer's greeting as he advanced across the floor and shook hands with all three—Bennett, the proprietor; Mc-

Henry sat down to listen to what he knew was coming—and, as usual, he promised by all that he recognized as good and holy to get busy and pull with the rest of the committee. Henry and Reilly had these little interviews every so often. Reilly would berate Henry for his laxity in association matters, Henry would promise to get out and hustle, and the promise would be the principal result—wherefore another visit from Reilly shortly.

Five Minutes of 6 P. M.

They were still talking when the whistles began their five minutes of blowing, which indicated 6 o'clock; Callawassa was notorious for the fact that it was 6 o'clock for five minutes every night. No two whistles blew at the same time. But as they blew tonight Ferris and McGinn slid off the desk, grabbed their coats and darted out the door.

"Some rooster party you were having," commented Reilly, as he and Henry walked across the floor toward the street where Reilly's and Henry's cars stood alongside the curb.

"Whaddyuh mean rooster party?"

"On the desk there," indicated Reilly, pointing to where the trio had been sitting when he arrived.

Henry laughed as he tumbled to the concealed thrust. "Just a little social session between the close of business and 6 o'clock."

"Have 'em every day?" Reilly was fumbling around on the dash of his Sennett and going through the motions of a man about to start a car.

Rival Inspects Rival

"No, not every day." Henry lifted the Sennett hood to take a look at the power plant of the rival machine and Reilly came alongside to listen to what the Redman representative had to say about the latest Sennett.

"It seems, Henry," said Reilly as they looked, "that every time I come down here to see you about some of these association matters I have to read you a riot act on something connected with your own business."

Bennett smiled. "What now?" He was always willing to listen. His great trouble in such things was that listening was the extent of his willingness. Reilly had told him many things he should do

to make himself a real dealer, and most of them Bennett had straightway forgotten. He was one of those born-in-a-rut men, who never stop to analyze themselves and, having analyzed, make changes for the better.

"It's this roosting on top of desks stuff," replied Reilly, and as he said it he looked Henry squarely in the eye, at which Henry smiled mystically. It couldn't be told whether he was approving or sarcastic.

"There are a few things like that which you ought not to do, Henry," Reilly



"She would turn around and beat it so fast you couldn't see her if——"

Ginn, the demonstrating driver, and Ferris, the sole remaining member of the sales force. Rivals they were in business—Reilly, the Sennett dealer, and Bennett, the Redman dealer—but friends they always had been and hoped they always would be. And, as usual, Reilly was on the trail of Henry to get him warmed up to action on the association committee of which he was a member. Henry lagged just a bit now and then. "Well, Henry, I'm after you again," smiled Reilly, as he poked the Redman merchandiser in the ribs to gauge his ticklishness.

"You mean yet, don't you?" replied Ferris, as his boss jumped about a foot.

"Yet is right!" asserted Henry, getting down off the desk and strolling toward the little private office at the rear, which housed a roll-top desk, a small but pretentious safe and a young oak table.



"—she saw you three men sitting on top of a desk drumming your heels"

continued. "You know, when you started out to be a dealer I gave you a few pointers and helped you get started, and ever since then I have taken a sort of proprietary interest in you and am anxious to see you walk to the top in this town——"

"I certainly appreciate——"

"No, you don't!" exclaimed Reilly. "You don't! If you did you would make an effort to be something besides one of these last-generation dealer-mechanics. You don't seem to care any more about whether you become a successful dealer or drag along in the tail of the procession until you get so far behind that you fall out."

"A dealer business is a big thing and is made up of big things, in a way. It consists in its income end of sales that aggregate several hundred dollars each; but the little things which appear of no consequence to you are the things which

lay the foundation for the bigger things. Details are what count.

"Now take this situation this afternoon. I walk in and find you and your salesman and your mechanic-driver sitting on a flat-topped desk in the salesroom, drumming your heels against the side of the desk. That's rotten business! It's disgraceful! Yet you do it and let the other men do it!"

The Thousand and One Things

Henry got a trifle pinkish around the back of his ears and looked critically at the Sennett motor. He had never seemed so interested before in Reilly's car.

"There are a thousand and one little things such as that which ought not to be done in a salesroom, and any dealer is wise to them if he stops and gives the matter a second thought. The trouble with you is, that after you have given it a thought you let it go at that and don't do anything about it. Would you go to a doctor and ask him what was the matter with you and then throw the medicine in a sewer?"

"No," plaintively replied the Redman man.

Throws Away the Medicine

"Well, that's just what you are doing with your business! You know things that ought not to be done and things that ought to be done, but you don't do a thing about it. If that isn't throwing away medicine I'll eat it.

"In selling your cars one of the things on which you have set your heart is a female clientele. You want to get your car known and liked by women, and you would like to have a stream of them coming in every day and making your salesroom a popular place with that sex. But what do you suppose any woman would do who walked up to your door and saw you and two other men—the only people in the place—sitting on top of a desk, drumming your heels? She would turn around and beat it so fast you couldn't see her go! That is, most women would do it, and that rooster array you had this afternoon never will give your place the prestige you want it to have.

Study Your Own Feelings

"And what's more, no man likes that sort of stuff. When you go into a store you don't like to have to drag a man down off a pile of boxes to wait on you, and you wouldn't wait long at a restaurant where you found all the waiters sitting around at the tables every time you went in—would you?"

"No."

"Yet you permit this same line of stuff in your salesroom—and you not only permit it but do it yourself. When I get so tired that I can't stand up any longer I go back into the office and sit down, and if any of my men can't stand

up I want them to do the same thing. But I won't have anybody sitting around in the salesroom, unless working at a desk. Having desks in a salesroom is all right; it is good. But they are there to sit at—not on.

"And when you have men roosting around on desks like that they develop into the kind which don't walk to the door when they see some one coming in. They both go hand in hand. When you're on the job, Henry, be on the job, and when you've got to loaf do it somewhere else than in the salesroom. You——"

"I know you're right, Reilly. I know you're right," asserted Bennett.

"And I know I'm right!" shot back Reilly. "But what's that go to do with the way your salesroom will be conducted tomorrow?"

An Idea Hits Home

Bennett didn't say anything. He kept looking at that motor. Reilly paused and looked at his younger competitor.

"Cheer up, Henry," he said, his hand on the younger man's shoulder. "Maybe I have said some harsh things—but you need it."

He climbed into the car and pushed the starter.

"Good-night," he said.

"Good-night," solemnly replied Bennett. And as Reilly drove away he didn't start for his own car. Instead he turned back to the salesroom, unlocked the door and went in toward the little private office. What for, Reilly—who looked back—couldn't guess. The truth was, Henry had had an idea—and it had hit home.

KANSAS CITY DELIVERIES

INCREASE BY 64 PER CENT

(Continued from page 11)

States. These states show a percentage of 108 for area sown as compared to 1914. The spring wheat of Nebraska and the Dakotas, of course, will not be sown until next month, but these states, like the southwest winter wheat states, have had great supplies of moisture in the ground this summer. The winter wheat states show an average condition of 85 per cent last December by the Department of Agriculture reports. It is believed the forthcoming report will show a condition above 90 per cent, which is exceptional.

Only the extreme western counties of Kansas have failed to show a decided improvement in the condition of the crop that will buy automobiles in the fall of 1915 and the spring of 1916. As a rule, the March winds expose the roots of the wheat and much damage results, but March this year has been almost without wind and no damage has resulted.

Very little of the 1914 winter wheat crop, which has been in farmers' bins

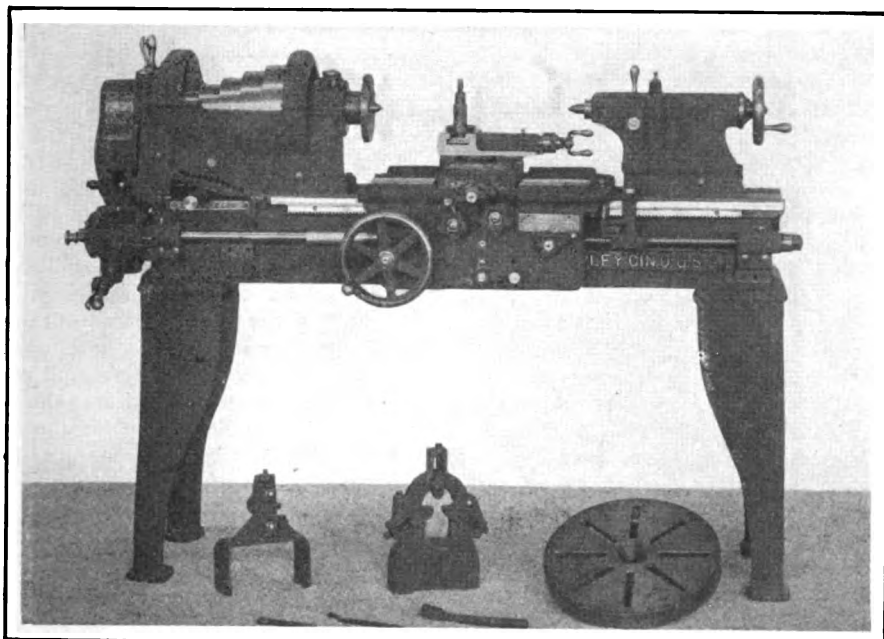
last month, has been moved in March owing to the condition of the roads. The writer estimated in Motor World last month that the winter wheat still held on the farms—and representing surplus available for automobile purchase—was less than 20 per cent of the crop. The Department of Agriculture estimate published March 4 gave its estimate at 17 per cent. So apparently the heavy purchase for the winter months of automobiles has not yet touched this surplus wheat of which there is nearly \$90,000,000 worth still in the farm bins of the southwest.

While the wet March will make the starting of farm work late, it will leave the ground full of moisture in the corn belt, which means great things to the farmer. The cattle quarantines in the west, while disquieting, have not demoralized the stock in any sense of the word. The government is taking vigorous steps to stamp out the foot and mouth disease. It is bending every energy to keep the disease off the big ranges because it is feared that if it gets started there it will travel on account of the absence of fences. The action of the western states in uniting with the federal government to pay for all stock killed as a result of finding the disease has caused every farmer to be on the alert to detect the first symptoms so the government can act. The payment by states for slain cattle, too, has made the farmer continue to handle cattle that he would not otherwise risk doing. The situation need not cause any alarm about general prosperity in the west.

The money market of the grain states shows money easy for strictly commercial purposes. The bank deposits in Kansas City, as representative of the western states, showed an increase in the last bank statements, March 4, to \$122,000,000 against \$110,000,000 last December and \$106,000,000 a year ago. The business man with products in course of marketing, and this applies to the farmer, has little difficulty in getting money, but there is little cash for building enterprises, etc. However, farm loans and real estate loan money is plentiful and there is greater demand for this paper than there is for the loans. The banks March 4 showed loans \$1,000,000 less than last December. Since March 4 there has been a slight decrease in deposits, due to the farmer's inability to market his products over muddy roads.

Hoover Ball Bearing Expansion

Although the Hoover Steel Ball Co., Ann Arbor, Mich., is only a little over two years old, its business has been growing so rapidly that a new factory building, 256 x 60, is now in course of construction. When completed there will be 230 men on the company's payroll as against less than 90 in 1913.



Lodge & Shipley general purpose lathes in 14 to 18 inch swing are well suited for garage service; the construction is substantial and accurate and little time is lost in operation

Garage Lathe With Quick Feed Change

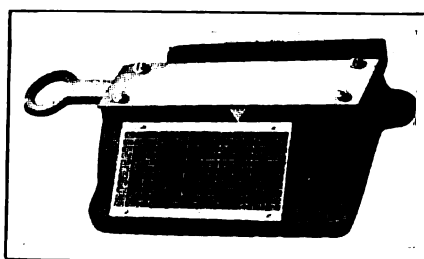
Lodge & Shipley Tool Incorporates Many Time-saving Features—Change Gears Permanently Mounted

A good example of the modern type of plain lathe of the size most used in motor car repair-shops—14-, 16- and 18-inch swing—is the machine manufactured by Lodge & Shipley, Cincinnati, O., a concern that makes nothing but lathes. The lathe is designed for the usual all-round service demanded of such a tool in the average shop, and its details are worked out with a view to giving the greatest convenience in operation.

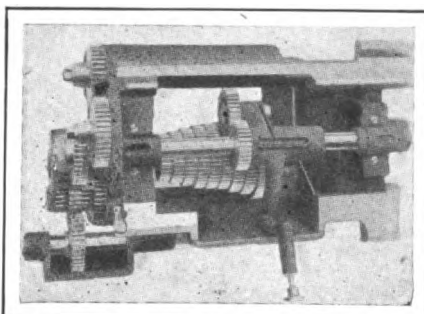
Heavy construction is a conspicuous feature of the headstock, which may be fitted with either a three-step or five-step cone. The cone is machined inside as well as outside to ensure good running balance. A time-saving detail is the fitting of a spring plunger, which is set with the fingers, for connecting the cone to the face gear when driving direct; this takes the place of the common screw, which must be set up with a wrench.

The back gear sleeve and pinion are cut from a single steel forging, and eccentricity is obtained by boring eccentrically the bushing on which the sleeve turns instead of reducing the diameter at the ends. Uniform speed progression is given by the back gearing. In the case of the three-step cone lathe, the two back gears are connected to the back gear sleeve by spline and key and are moved in and out of engagement with

the gears on the cone spindle by an easily manipulated shifter lever. A latch provides for locking the gears both in and out and also for taking up wear on teeth.



Index handle shifts one set of gears and indicates the gear positions for the other set



The feed gears, showing the gear cone and the sliding gear which meshes with the cone gears

With the exception of the back gear and spindle gear, all headstock gearing is cut from steel forgings; this includes the feed gears. Covers are provided for all gears. The spindle, in the case of the

Swing	16 inches
Swing over carriage....	9½ inches
Distance between centers..	6 ft. 9 in.
Front spindle bearing ..	2¾ x 5½
Rear spindle bearing....	2 1/16 x 4
Hole through spindle.....	1 5/16
Spindle nose.....	2¾ diameter
Width of belt.....	2¾
No. of thread and feed changes..	50
Will cut threads.....	2 to 64
Feeds per inch.....	4 to 123
Number of spindle speeds.....	18
Weight on skids, crated..	2,535 lbs.

16-inch lathe, has a front bearing 2¾ inches in diameter and 5½ inches long, while the rear bearing is 2 1/16 x 4 and the hole through the spindle is 1 5/16 inch. Bearings are of babbit, readily renewable. The threaded nose is 2¾ inches in diameter, 6 threads to the inch, U. S.

The tailstock is as heavy in proportion as the headstock and several of its details are of interest. The spindle is locked by two plug clamps which do not throw it out of center when tightened. There is a set-over, with suitable screws, for taper work, and a 2-inch index graduated in sixteenths. The shape of the tailstock is such that the compound rest may be set at an angle of 90 degrees even on the smallest work. Two bolts are used in clamping the tailstock to the bed, and these are brought to the top, where they are conveniently reached.

To provide rigid resistance to the strain of a heavy cut on small work there is a supplementary right angle bearing on the bed directly in line with the pressure due to the cut. The carriage is rigidly constructed, having been made larger and heavier than is usual. To keep the shears clean and well lubricated, there are wipers and oilers secured to both ends of the carriage; these clear off chips and dust and wipe on a film of oil at each passage of the carriage.

Rigidity in the apron is ensured by the use of heavy castings with three heavy braces for the entire depth, diagonal braces to stiffen the rack pinion stud bearing and a longitudinal brace across the bottom; the apron is tongued and grooved, as well as bolted, to the carriage. The gearing, with the exception of the frictions, is cut from steel and where gears turn on studs they are bushed with bronze. Steel studs are hardened and ground.

To minimize wear and maintain ac-

curacy the threads of the lead screw are never used except when the lathe is cutting threads; a spline on the lead screw engages with a feather in a sleeve in the apron, the sleeve having a bevel pinion at each end. By sliding the sleeve longitudinally, either of the bevels may be engaged with the gear forming the first of the train through which drive is transmitted to the rack. The feather in the sleeve is long, to provide ample bearing surface; the corners of the spline in the lead screw are rounded so that they cannot cut the nut when screw-cutting is being done.

The feed through the rack is operated through a friction member, as is also the power cross feed; this provides for slippage, which prevents damage in case the feed is allowed to run beyond the limit. A safety device prevents the engagement of the rack and the lead screw

feeds at the same time through possible carelessness of the operator.

Perhaps the feature that will appeal most to the repairman who is familiar only with the old-fashioned screw-cutting lathe is the change gear system for screw-cutting. Instead of having a pile of loose gears under the lathe, to be picked over and the right ones slipped on the studs at the back of the headstock when threads are to be cut, all the gears are assembled into a cone and mounted permanently on a spindle under the headstock, protected from dust and chips. There is a gear which slides on a spline on the lead screw and which is permanently in mesh with a second gear which slides with the lead screw gear and can be dropped into mesh with any gear on the cone. Other intermediate gears provide four more speed changes, the arrangement being such that

there are four times as many feed changes as there are gears on the big cone; 50 different threads can be cut, from 2 to 64.

Changing gears and setting for a given feed for screw-cutting is extremely simple. An index plate, showing in columns all the threads the lathe will cut, is mounted at the extreme left end, and along the top slides a pointer operated by a handle at the left of the plate. The operator slides the pointer to the desired thread number; this automatically engages the gears of one set and at the same time the pointer indicates the position for the handle controlling the gears of the cone. Setting the cone gear locks the system ready for service.

The equipment regularly supplied with cone head lathes includes steady and follow rests, large and small face plates, cone countershaft and wrenches.

Systematizing Free Service Cuts Cost of Labor in Two

Accomplished by a Few Men Working Continuously Instead of Many Men
Spasmodically; Troubles Nipped in the Bud

Free service eats profits.

It is a big problem; yet the A. Elliott Ranney Co., New York Hudson distributor, has cut this expense in half by systematizing the service given; complaints have been reduced to four a month with 3,000 cars in operation, although in 1910, with but 500 cars, it was not unusual to receive five complaints a day.

Simply to test the efficiency of this systematic free service idea, the superintendent of the repair department was sent to the recent New York show to meet complaining owners, and all the salesmen were instructed to turn any owners with complaints over to him. Only three complaints were registered during the seven days, and two of these were minor carbureter troubles.

Every Car Inspected Every Month

In addition to eliminating complaints, the lives of the cars have been materially increased and owners that did not understand their cars and were obtaining poor results have been turned into boosters.

Briefly, the system consists of the inspection of every car less than one year old in the Metropolitan district once a month. The car is brought to the Hudson service station by the owner or his agent and left there for a few hours while it is gone over thoroughly, all adjustments tested, bolts and nuts tightened and the car completely lubricated.

The advantages of this systematic service are many. Considered merely from the selfish standpoint of the dealer

Fig. 1.—Letter informing new owner that car requires some attention to give good service, and telling of systematic service plan

Dear Sir:

Apropos of the statements made you when you purchased your car, this letter is written to emphasize the fact that while you have bought an excellent automobile, it still is a machine and requires attention.

Man has not yet been able to produce a machine that is automatic. In this car lubrication alone is not sufficient. The rough usage to which an automobile is put—the bounding over roads—the speed at which the car is driven, all tend to loosen nuts and disarrange adjustments. Even a locomotive, which is driven by an expert over steel rails and up grades that in no case exceed 10 per cent, is thoroughly overhauled at the end of every 200-mile trip. More is asked of a motor car. We ask the privilege of keeping your motor car in trim. We can only do this by frequent inspection.

We will notify you from time to time the dates on which we will be in position to give you this gratis service. We do it in self protection, for if we can get your car as frequently as we shall ask, we will be able to protect and eliminate the causes in their incipency for what would ultimately become a serious conditions. Nuts can be tightened, adjustments made, and in many other ways the service of the car can be raised to a higher efficiency and a greater permanency.

If you do not cooperate with us to the extent of delivering your car at our shop for these inspections at the time stated, we, of course, will have to charge you for it. It is only by such inspection that we are able to keep down the cost of the service, for haphazard service is too expensive for us to attempt to handle.

Very truly yours,

The A. Elliott Ranney Co.

it has numerous merits. First, it cuts down the time that must be given to this work, because by doing the work regularly and systematically less time is required than if it were done haphazardly. Serious troubles are avoided. Under the rigid system of inspection, for instance, a valve out of adjustment would be detected and set right while otherwise the car would be operated by the owner until it might need grinding and he would then come and ask to have it ground and expect it to be done free.

System Simple and Satisfactory

Many owners and some chauffeurs do not oil the car properly at first, and there is danger of bearings wearing or burning out. Such troubles as these are corrected by the monthly inspection. They are nipped in the bud, labor and materials are saved, the time the owner is deprived of his car is reduced, the running of the car is improved, the time when a thorough overhauling must be given is considerably postponed, and as a result the owner becomes an enthusiastic booster.

The system used in giving this service is extremely simple; there are few forms and letters and little clerical work. To begin: The new owner is sent a form letter (Fig. 1) soon after receiving the car, calling attention to the fact that any car requires a certain amount of attention to give good service, that it is not automatic, and that he will be asked to bring his car in for inspection from time to time.

Following this letter, and a few days

Fig. 3—Follow-up letter, sent when a period is overlooked. It calls attention once more to the advantages of the free service

Dear Sir:

On October 2nd we wrote you requesting that you have your car brought into our Service Department for its regular monthly inspection. Up to the present writing your car has not been in our Service Department.

It is our desire to have every Hudson owner in our territory receive the maximum service out of his Hudson car, and we wish to impress upon your mind the importance of having your car come into our Service Department once a month, so that the same can be properly inspected and you be advised of any omissions to look after the same properly.

This inspection costs you nothing, the intention being that should any parts requiring lubrication have been neglected, it is our purpose to check up by this system of inspection on the person operating the car and who is charged with the care of same, so as to eliminate all possible trouble. This can be done while the car is new and before serious injury is caused by a slight neglect.

Yours very truly,

The A. Elliott Ranney Co.,
Service Department

before the car is to be brought in, a red postal card (Fig. 2) is sent to him, informing him that the service department will be ready to promptly inspect and lubricate the car between two days mentioned.

If the car is not brought in before 6 P. M. of the last day specified, it must go over to the next period at the owner's risk. If repairs are required meanwhile they must be paid for.

The object in limiting the owner to a certain time is to prevent periods of congestion. If the owner were simply required to bring his car in any time during the month, he might select a time when there were 20 cars ahead of his and it might be two days before he would obtain his car, but by specifying a time all delays are avoided and each car is examined on schedule.

Attention Called to Neglected Details

If an inspection period is ignored or overlooked, a letter (Fig. 3) is sent to the owner, calling his attention once more to the advantages of the inspection.

When the car is received, a large tag (Fig. 4), giving a list of all the inspection points, is made out. If a certain part is found to be all right, an O. K. is placed in a column at the right and if not a cross is placed there.

At the top of the card is a space for the owner's name, address and telephone number, the inspection number, date received and delivered, and the car number. At the bottom there is a space for remarks, and a place for the tester, inspector and owner to sign. The latter's signature is required when the car is delivered. If the owner comes for his

car he is informed of the various things he has neglected and it is a matter of record that whenever a fault is called attention to it is corrected at once by the owner and not allowed to happen again.

Salesmen Keep in Touch With Owners

If the chauffeur comes with the car, then the owner is written a letter informing him of its condition and informing him, in a way that will not throw unmerited blame on the chauffeur, the parts of his car which have lacked care.

It sometimes happens that an owner fails to understand the meaning of this free service idea and does not avail himself of the opportunity to have his car put in shape, or it may be that the postal asking him to bring his car in does not reach him, and it is here that the salesman steps in to aid. Just as a matter of good business, the salesmen are required to get in personal touch with every one they have sold a car to once

a month. Each one must make the call either in person or by phone, and if he fails to reach the customer he may then write a letter. It is the salesman's duty to find out what satisfaction the car is giving and to call attention to the inspection service. In this way the purchaser feels that the concern is taking an interest in him.

Silver Cup to Kieffer & Steele

A large silver cup, donated by the Lehigh Valley Show management for competition among the dealers exhibiting at the South Bethlehem (Pa.) show, to be the property of the dealer making the greatest number of sales during the week, was awarded to Kieffer & Steele, Easton, handling the Haynes and Chevrolet cars, who disposed of 15 cars. Charles Snyder, of Allentown, ran a close second, having sold 11 Saxons. All told, there were 133 cars sold on the floor during the week, representing a total of more than \$200,000 of new business.

THE A. ELLIOTT RANNEY COMPANY	
MONTHLY SERVICE INSPECTION	
Inspection No. _____	Date Received _____
Owner _____	Date Delivered _____
Address _____	Car No. _____
Tel. _____	
The following parts that are found neglected will be indicated on margin with an "X"; the parts found to be O.K. will be marked with a check.	
<p>Motor Reservoir</p> <p>Examine clutch for oil _____</p> <p>transmission for oil _____</p> <p>differential " " _____</p> <p>all wheel bearings _____</p> <p>Oil generator oil holes</p> <p>Examine and turn down following grease caps:</p> <p>2 front spring front _____</p> <p>4 front spring rear _____</p> <p>2 spindle balls _____</p> <p>2 rear spring front _____</p> <p>4 rear spring rear _____</p> <p>2 tie rod balls _____</p> <p>1 fan _____</p> <p>2 water pump _____</p> <p>1 generator _____</p> <p>1 steering post lg. _____</p> <p>1 steering worm wheel shaft _____</p> <p>1 propeller shaft _____</p> <p>1 clutch collar _____</p> <p>1 clutch throwout pivot pin and brake pedal rod _____</p> <p>1 speed lever finger pivot pin _____</p> <p>1 propeller shaft rear box _____</p> <p>1 torque rod front pin _____</p> <p>1 torque rod rear pin _____</p> <p>1 emergency brake (crown) trans. rod _____</p> <p>Examine universal joint grease plug front</p> <p>1 universal grease cap rear _____</p> <p>Examine and tighten following bolts and nuts</p> <p>6 bolts on front spring _____</p> <p>6 bolts on rear spring _____</p> <p>All body bolts</p> <p>6 motor bolts _____</p> <p>Examine motor bracket rivets</p> <p>" torque rod and support _____</p>	
<p>Inspection life _____ Date _____</p> <p>Our Service Department will be ready promptly to inspect and lubricate your car on or between _____ and _____</p> <p>It will be necessary that you bring your car for this inspection between the times mentioned and within 48 hours of this date. Repairs will have to be put away until the next period of inspection.</p> <p>Inspected by _____</p>	
REMARKS:	
Above parts examined by _____	
Above parts and car tested by _____	
Owner's Signature _____	

Fig. 2—Right—Post card informing owner when service department will be ready to inspect car. Fig. 4—Tag used in inspecting car. If a part is all right an O. K. is placed on the line and if not a cross mark

WIDE-AWAKE MERCHANDISING

SEVEN FAILED ONE DIDN'T

**The Men With the Stereotyped
Talk Were Turned Down—
Get a New Approach**

"I hear you're in the market for a car," says the salesman, and almost instantly the possible customer replies, "Nothing to it. Who told you that?"

In a city of 40,000 population there are seven motor car dealers. Every one of them called on a well-known prospect and began conversation with the stereotyped sentence, "I hear you're in the market for a car"—that is, all of them but one.

He Got Out of the Rut

He knew that the man was seriously in need of a car from a business standpoint and he began his conversation with, "You ought to have a car, Mr. Vincent," and then went on to show him some reasons why he ought to have an automobile, leading up to the reasons why his particular car should be the one selected.

He got the order. The others got turned down.

The suggestion is: Try and find some other way of approach than the one that you know everyone else is using.

SPRING BUSINESS OPENS WITH RUSH

The selling season is on—that is, if we admit that there is such a division of the year. Even up in the small towns, where snow abounds during the winter in such quantities as to make it well nigh impossible to sell cars, the windows are being washed, the signs brightened up, the cars dusted, the used cars gone over, and someone is on the job where for a long period someone has been "off the job."

In a word, it is Spring.

And that means that trade is opening up with a rush. Sales are being made every day. These are the times when

the first bright day brings people into the salesrooms.

And the live dealers everywhere are working their heads off to sell as much of their season's allotment as possible. A car sold now is delivered right away—and the more you sell now the less you will have to worry about later on. Don't wait till April—get busy now.

EMPLOYEES REFLECT THE BOSS'S HABITS

All employees are more or less chameleon-like; they reflect the habits and methods of their immediate chief. If the "boss" is careless of time and indifferent to appointments he will discover that, except in a few rare cases, his employees are likewise. If the "boss" is thorough, prompt, business-like, that will be the atmosphere of his business-place. When the boss knows this he takes a brace—and the tone of the entire establishment is invigorated. Think it over.

INERTIA IS A DEADLY FOE

**Most Salesmen Who Fail Can
Trace It Directly to Absence
of Real Activity**

The most deadly foe to the salesman who sells automobiles or any other specialty is inertia.

What is inertia?

The standard dictionary says it is "Absence of activity." Are you making the rounds and seeing the people? Are you helping them by the right sort of suggestions as to the salient points of your car?

About nine times out of ten the salesman who isn't making good can trace his failure more or less directly to inertia, to absence of activity. He stagnates instead of hustling.

Get busy.

Making a Shallow Window Look Deeper Than It Is



This window, of the Firestone branch in Washington, D. C., is but four feet deep, but the display has been made to give an appearance of greater depth. The semi-circles do the trick, setting the tire in a false perspective. The semi-circles are made of window dressers' strips, which cost 75 cents per 100 feet. They are $\frac{1}{4} \times \frac{1}{4}$ -inch and can be bent or twisted. The cotton—50 cents' worth—is pinned on. The icicles are strips of cloth, cut with shears. The non-skid tread track in the center is made by pressing a casing or retread strip into the sand. The lights are red, the red glow on white being very effective. The window was built by K. J. Hines, of the branch.



—Hardware Age.

Cultivate Spirit of Independence

Much Good Can Come From Encouraging Your Employees to Voice Their Opinions

Do you encourage your salesmen and your other employes to have an opinion? One of the best dealers in the country discovered early that it pays to cultivate and nourish this spirit of independent thought among his employes of all ranks.

Once a month a dinner is held, at which the salesmen, office force and service department employes all meet on the level. Store topics are discussed with the utmost freedom and many wonderfully good suggestions have come from sources that might never have been tapped but for the opportunity.

Wants Everyone To Be Interested

"My employes are encouraged to come to me with suggestions even though they have no bearing on the work of the department in which such an employe may be engaged," said this dealer. "One of the best advertisements we have ever used was written and suggested by our bookkeeper. He saw a point in our selling scheme that could be enlarged upon to splendid effect.

"Another amazingly good idea came

from one of the boys we employ to sell gasoline. Still others have come from stenographers, service men and other employes.

"Our idea is to have everybody feel a keen interest in the business. It means more money for the employe and better service to our customers because it stimulates the employes to think.

Team-Work Right Through

"And I am convinced that half the battle is won when we can get our people to think. Moreover, we are developing and encouraging mutual confidence—and building an organization in which there is team-work from the bottom up as well as team-work from the top down."

FEW RESULTS FROM "SCARES"

One Manager Tried to Scare His Men Into Selling Goods—He Failed Dismally

You cannot frighten a salesman into getting business for you. Some way or other the good salesman refuses to be scared. He may be coaxed, or cajoled, or flattered into doing something, but you can't "scare" him into selling goods, and the man who tries to scare him always scores a failure.

Not long ago a new manager took hold of a store. There were eight salesmen. The sales on a certain line of cars had been slack for some reason or other. Perhaps the salesmen had not been properly sold on the type of car. At any rate, the fact that not one of the salesmen had been making a really good record on this line would have prompted a man with an analytical turn of mind to try and find out why. But the new manager was not analytical. He wanted results. He was going to get them or know the reason why.

On Monday every salesman received a note saying that unless he sold at least one car of the particular type referred to during the coming six days he would be "fired." During the coming week only one man out of the eight made a sale of said cars. The other seven never even tried. They got their money and quit without losing any time over it.

DISPLAY HELPS FOR THE DEALER

There are many devices which are supplied by accessory manufacturers to their dealers for the better display of merchandise. One is illustrated herewith and this will be followed by others which have been especially designed for the purpose of assisting the dealer in bringing his merchandise to the attention of possible purchasers. Manufacturers who supply these devices are urged to forward photographs or sketches of them.



Every car owner needs spark plugs sooner or later—and he will purchase them if he is given the suggestion. The suggestion lies in displaying them where he cannot fail to see them.

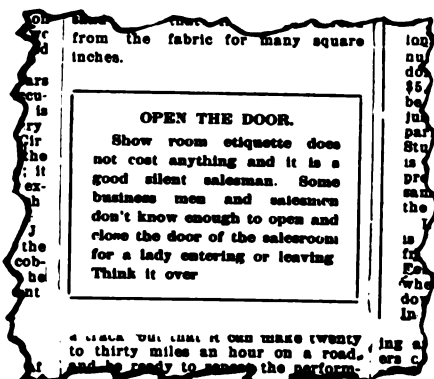
Among the various display fixtures which are supplied by makers, is the counter card which is illustrated herewith and which is supplied by the Champion Spark Plug Co., Toledo, Ohio.

This is a handsomely lithographed card, 19 x 13 inches, and shows the plugs to advantage. It will stand on your counter and give the subtle suggestion that leads to sales.

It is supplied by the Champion company with an initial order of 100 plugs, which may be of several types.

It is shipped complete, ready to set up, and displays six plugs of as many different types, or the entire half dozen may be the Champion X, which is for Fords, or the Champion O, which is for Overlands.

Think It Over



Extract from the house organ of the A. W. Haile Motor Co., Studebaker distributor in Buffalo

Two Window Displays That Made Prospects

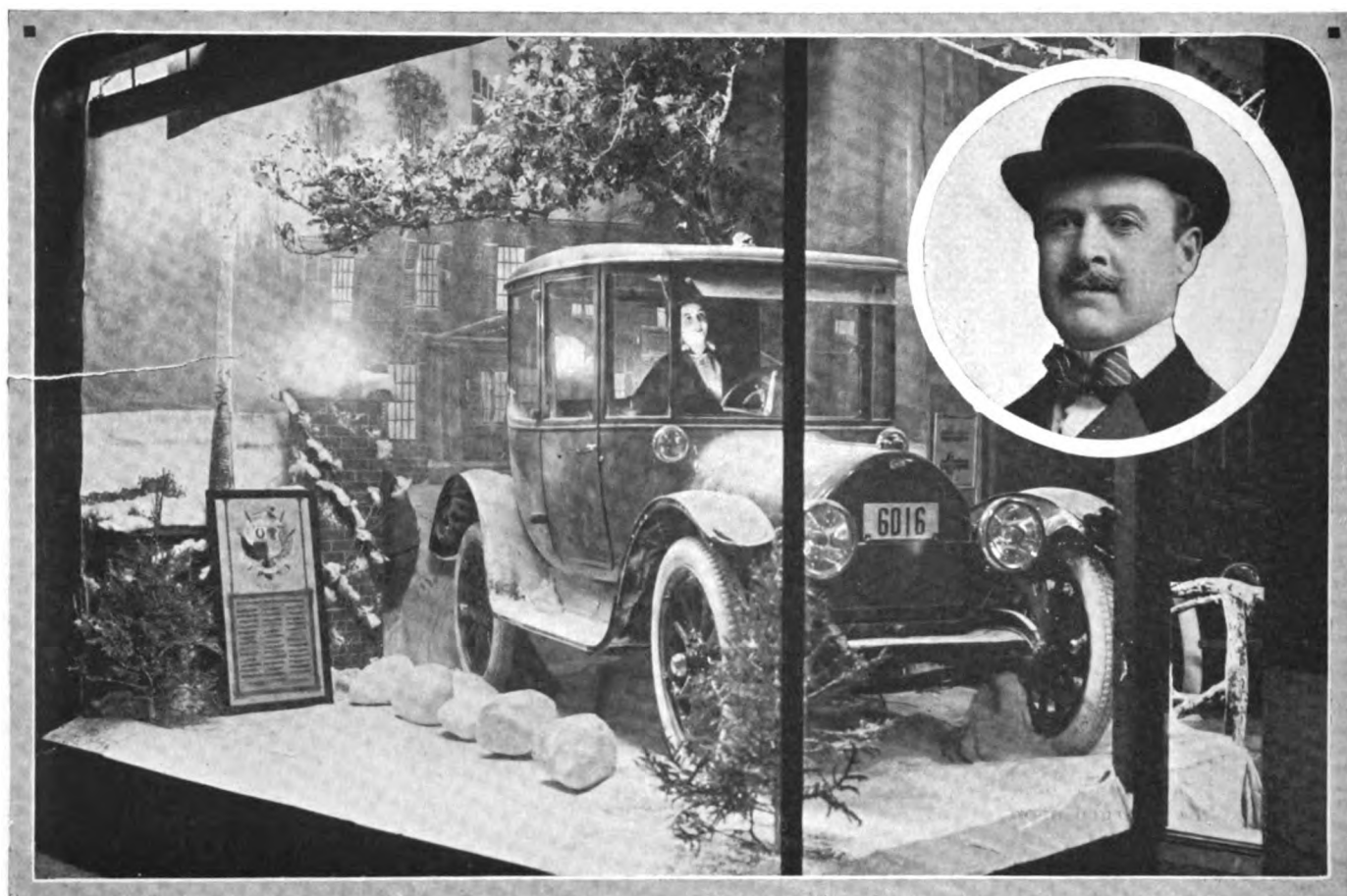
Easily Obtained Contrast Cost Little to Arrange and Carried a Message
Most of the Work Done in the Service Station at

Bowman & Libby, Inc., Overland distributor in Minneapolis, had two of the most attractive show windows in the Twin City during the recent motor car show week.

The Bowman & Libby store is one with a door in center in front and a show win-

dow at each side. The left window was a cold winter snow scene, exactly the kind of weather you are greeted with show week in the Twin cities. The other window was a summer scene. The snow window was built around an Overland coupe, which was well covered

with snow, the setting being made more realistic by the floor of the window being piled high with artificial snow and corners filled with one or two evergreen trees laden with snow. The four wheels of the car were spinning at traveling speed and the dummy in the seat looked



This is the realistic snow scene which Bowman & Libby built in one of its broad show windows, and which was so true to life that it never failed to draw attention of the kind that makes sales. Insert is F. W. Libby, secretary-treasurer-manager of the company

SNOW SCENE WITH COUPE

The backdrop painted by a local scene painter pictures a handsome residence in good perspective, with electric lights at the back shining through the windows and the moon. The coupe is apparently passing through the gates of the residence, the wheels being turned by an electric motor concealed beneath the platform. The company's men went out in the woods and cut the two oak trees used in this display. The snow effect was obtained by using white muslin painted with white alabastine, as were the oak trees and stones beside the road, all being sprayed with ground mica, which glistened like snow crystals. As it was an evening scene, the blue moonlight effect was obtained by using blue globes on the electric lights. Flour and cotton were also used sparingly on the coupe and on the brick wall. The rustic fence was made by our own men from trees brought in from the country.

LIFE-LIKE SPRING SCENE

The spring scene consists of a country landscape with hills and winding road as a backdrop, with a pergola covered with flowering vines, and a fence. The fountain in front was running and contained several hundred live minnows. Artificial morning-glory vines, tulips and lilacs were purchased, the latter being twined on bare boughs with a very natural effect. The grass was procured from a local chicken fancier, who had a quantity dried. A bushel basket of this was sufficient. It was made realistic by being dipped in green alabastine. The tulips were set in natural brown dirt, and the driveway was of sand and gravel. A warm sunset glow was thrown over the exhibit by orange-colored incandescent lights, making the spring scene a warm contrast to the cold, blue snow scene in the opposite window.

The cost of the exhibit, exclusive of the labor, was \$216, itemized as follows:

Carry Away the "I-Want-the-Car" Germ

That Left an Indelible Impression on the Minds of Those Who Saw It—
Total Cost of \$216 for All the Material

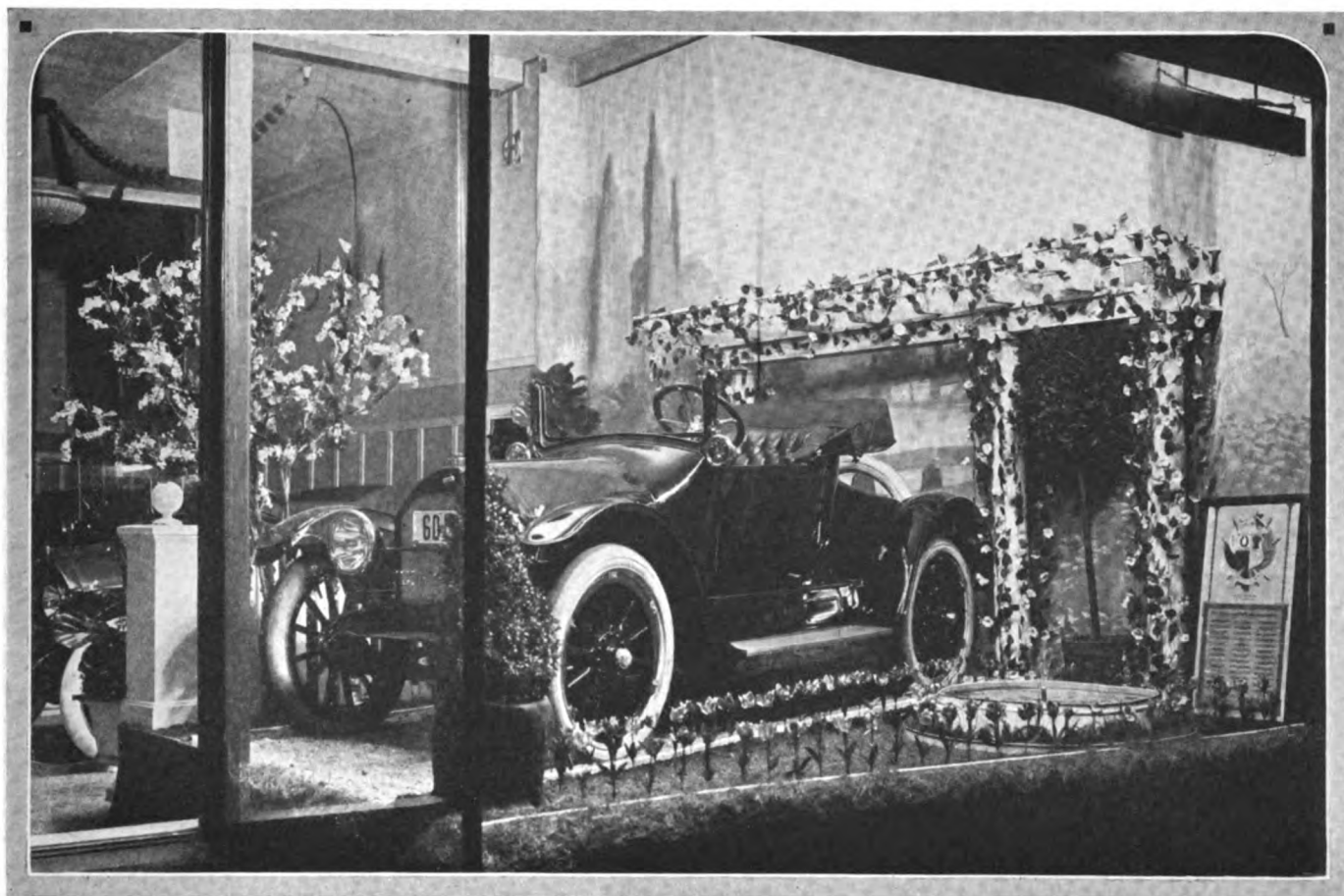
particularly lifelike. There was even a long veil which floated out behind under the influence of an electric fan.

The other window was a real summer one, with a nice gravel road (real gravel), a fountain of real water and flowers all around. This window dressing was

a success because it set the mind of every passerby working. Here was a contrast, summer and winter. Here was a strong selling argument, the coupe as a winter car, the open touring car for summer. Here were windows that had real selling merit, not just decorations.

The "call to the road" was suggested by each window.

They literally compelled those who saw them to carry away the "I-want-the-car" germ that every live salesman must inject into his prospects before he can hope to turn them into purchasers.



In the opposite window there was this typical spring scene—a veritable call to the woods and no less alluring in its suggestion than the snow scene. Each car was shown to its best advantage

ITEMIZED STATEMENT OF COST

Two backdrops, \$50 each.....	\$100
Artificial flowers	40
Pergola and fence.....	13
Fountain	13
Electric lights and wiring.....	22
Sundry material, including paint, paper, excelsior, burlap, muslin, etc.	23
Total	\$216

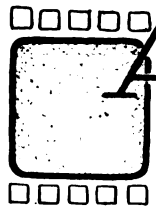
The collapsible platforms on which the cars rested were made from lumber used in double-decking shipments of cars from the Overland factory. The electric motor was taken from the repair-shop and set up beneath the coupe platform to keep the wheels revolving, giving the impression of motion.

EXHIBIT EASILY ALTERED

The entire exhibit was first set up in the repair-shop, and when ready to install the windows were closed for one day and night while the exhibit was being installed in our show-room.

Latterly, the exhibit has been changed, replacing the coupe in the snow scene with a delivery wagon driven by a very realistic-looking figure, with a box of groceries on the floor beside him ready for delivery at the next stop. The roadster in the spring scene is replaced by a coupe with all windows down, suggesting its desirability in summer, following the demonstration of its comfort in winter.

The fact of the windows being darkened for 24 hours made passersby curious to know what was coming. They looked forward to seeing something out of the ordinary; and the effect of the display was thus made more lasting and impressive.



Advanced Maintenance

ALUMINUM SOLDERING AND WELDING

By George Fernwell

(Continued from last week.)



A PRECAUTION the use of which will be seen later is that in addition to the coating of the surfaces to be joined, as described in the last issue of Motor World, a small area should be cleaned and coated with solder on the exterior surface of the joint which will be uppermost in reheating and clamping.

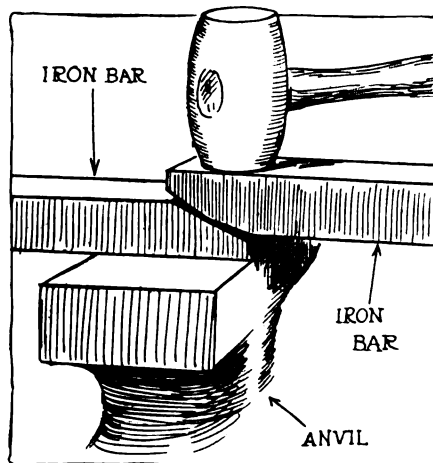
The condition of the aluminum soldering repair is supposed to be such that the surfaces to be joined have been coated with solder and then clamped together. Now have ready for instant use a wrench for tightening the clamp and also see that the clamp screw has some spare thread for further clamping.

Place the casting on a brazing hearth and surround the joint and adjacent metal with charcoal or fire-brick; then with the blow-pipe flame first bring the charcoal to a red heat and proceed with the blow-pipe flame to heat uniformly the casting where joined at the fracture until the coating of solder on the abutting surfaces is thoroughly melted.

As this coating will be practically invisible it will be difficult to determine exactly when the melting point has been reached. To make this easier is the object of the small area outside the joint being coated with solder before placing the work in its clamped position on the brazing hearth. As the casting becomes heated the small solder-coated surface referred to may be continually tested with a stick of the same aluminum solder used to coat the surfaces of the joint.

When the metal is sufficiently heated to melt the solder applied to the small

coated surface, it may be safely assumed that the casting is hot enough to melt the coating of solder on the surfaces of the joint, so that it will flow and mix thoroughly.



The scarfed ends of two bars to be welded must make contact at first only at the middle of the scarf

The work will then be hot enough for the final forcible tightening of the clamp screw, meanwhile applying the flame of the blow-pipe quickly and uniformly all over and around the joint. The joint and casting should then be allowed to cool slowly and uniformly.

After complete cooling has taken place the joint can be filed or ground so as to render it almost invisible. Especially would the latter be the case if a sand blast be applied to the work as a finishing process.

forms of scarfs are employed to suit different conditions of materials or the nature of service required of the finished work.

In some cases the ends to be joined are "upset" or thickened before scarfing. Probably the simplest and most frequently used method of scarfing is that required for a lap-weld.

Various smiths have their individual ways of forming scarfs for lap-welding. When using a blacksmith's forge for welding an important aid to success is the properly managed fire, especially when using coal. The fire should be deep so that the flame of the fire may have a minimum oxidizing effect on the metal being heated.

Gas Makes Cleanest Welding Fire

Coke is a much more satisfactory fuel for welding, as with coke the iron does not become oxidized. Also with coke there is little or no scaling.

A gas furnace or forge is the cleanest in use, with the added advantage of always being ready. A gas flame also can be regulated by means of air and gas valves so as to obtain the very desirable reducing or non-oxidizing condition of the flame. The latter may readily be determined by noting the effect the flame has on the end of a round iron rod.

If the iron scales in the flame there is too much air, and if, on the contrary, the iron become coated with soot the proportion of air is too small. As nearly as the right condition of the flame can be determined by its appearance, the less color the flame has the better.

A flux is required for welding wrought iron or steel—that is, with such grades of the latter as can be welded. Fine white river sand is preferably used as a flux for welding wrought iron. Borax which has been burnt or calcined to remove its moisture is in general use as a flux for welding some kinds of steel.

In scarfing the ends of wrought iron bars for welding a point necessary to observe is that in the necessarily quickly carried out act of bringing the heated bars out of the fire and placing them in position on the anvil for welding, the contour of the ends be such that contact occurs at or near the middle of the weld.

This is best insured by previously forming the scarf so that it is of cylindrical contour in the case of flat or

PRINCIPLE AND PRACTICE OF WELDING

Making Scarfs, Heating and Working Out Slag Important Steps

IT is very desirable that the workman contemplating becoming proficient in the use of acetylene-welding apparatus should become informed of the nature of some of the difficulties of the older or blacksmith's process of welding.

The temperatures at which a blacksmith would weld wrought iron are very much less than those obtained with the oxy-acetylene torch. Wrought iron in

general welds at about 1500 deg. Fahr., although in some cases at this temperature the metal would melt and in doing so prevent welding.

To weld two pieces of wrought iron by means of the blacksmith's forge, hammer and anvil, the pieces must first be "scarfed" or prepared at the ends to be joined so that a diagonal splice will be formed at the finished weld. Various

square iron bars or of slightly spherical contour in the case of scarfing round bars for welding.

This slag must be worked out of the joint before a perfect and strong weld can be effected. The working out of the slag may be made possible by so shaping the scarfed ends that contact occurs in the middle of the weld and, further, that after this initial contact is formed in the center of the weld the latter is hammered together in such a manner that an increased area of contact in the weld is effected first nearest the center, pushing the slag out of the weld in the process of gradually causing contact or union of the surfaces from the center towards the outside.

Welding Heat Close to Burning

If the scarfed ends are so shaped and brought together at welding heat that the faces are parallel to each other, the slag under hammering will be permanently enclosed within the weld.

A weld made under the last named conditions might have a deceptive appearance of being perfectly joined, while in reality the slag locked up in the weld would cause it to be brittle and probably weaker than a corresponding mass of cast iron.

The right condition for welding is the plastic state produced at a temperature somewhat below but dangerously close to the melting or burning point. No strength or durability can be expected of a weld which is burnt, as in a possible reheating of the weld.

Where possible, pieces of a grade of wrought iron or steel with which the workman is unfamiliar should be experimented on to ascertain the color at which that particular grade of iron or steel will burn.

The general procedure to be observed in blacksmith welding may be outlined in the case of welding two iron bars of rectangular or circular cross section.

Scarf May Be Forged or Cut

Upset the end to be welded of each bar by heating to a bright red, holding the bar perpendicular to the face of the anvil and striking the latter with the heated end with vigorous perpendicular blows, stopping as may be required to straighten the bar with a hammer where bent.

Then after reheating, shape the end of each bar to form a short, blunt one-sided wedge similar to a wood chisel, or, if skill is lacking with a hammer and it is more desirable to gain experience in welding, the scarf may be formed with a hacksaw or a file.

As indicated before, the two ends to be welded should not be so shaped or scarfed that when fitted together the surfaces to be welded are relatively parallel. On the contrary, at least one surface should be made convex so that

contact between the two surfaces when brought together at welding heat will occur only in the middle of the weld.

Coal Fire for Welding Should Be Deep

Scarfing being completed as suggested, attention should be given to the fire. This should be banked up with dead coal in order that the bed of live coal may be deep as possible, for the practical reason that a deep bed of live coal, as compared with a shallow fire, will produce a flame near the top having less oxidizing effect on the metal being heated. The fire then may be blown up until it is thoroughly hot and the scarfed ends placed near the top of the fire but covered by live coal.

A supply of fine white river sand should be conveniently at hand on some part of the forge.

Heat both irons uniformly, changing their position in the fire as may be necessary should one be getting hot more quickly than the other. As soon as the bars are red hot at the ends each should be withdrawn in turn, the heated end, especially the actual surface to be joined, fluxed with sand by either dipping the bar in the sand or, if the bar is too heavy, by applying sand to the heated end with the hand.

Same Heat on Both Bars

The iron bars are then replaced in the fire as before and heated (as a general recommendation) to a white, but not a dazzling, heat. Great care is required at this stage on the part of the novice not only in heating one bar to exactly the right degree, but also in ensuring that both bars are heated to the right degree at the same time.

If a helper is at hand, he may get ready to withdraw from the fire and place on the anvil the bar which is to

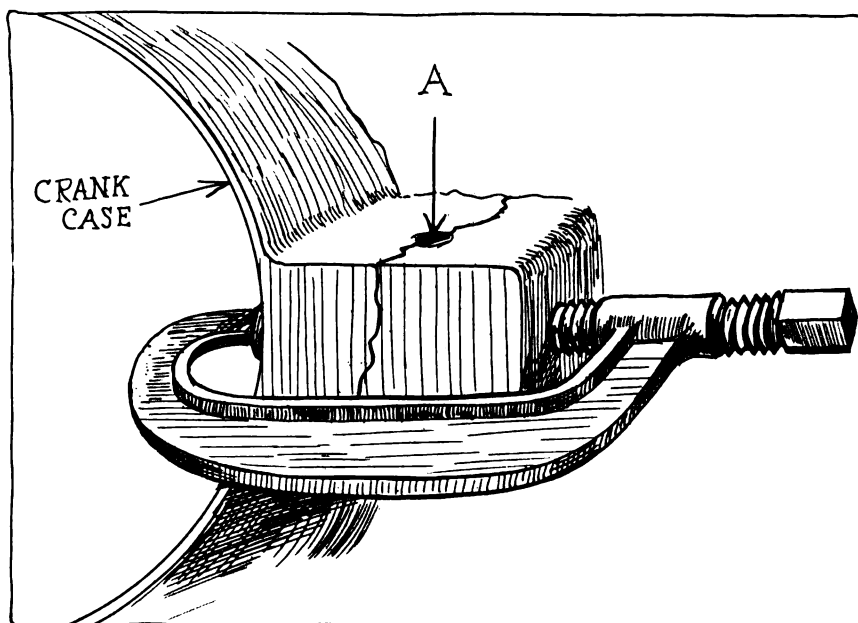
be the underlap of the two when in position on the anvil for hammering.

At exactly the same moment that the helper withdraws a bar from the fire to place it on the anvil, the workman should take the remaining one and place it so that the lap is on top of the bar held on the anvil by the helper; the workman by pressing downward can hold the helper's end in place from falling off the anvil and thus learn how to dispense with the helper's services on light work.

Must Strike While Iron Is Hot

Not an instant must be lost in commencing to hammer the weld together to full contact. The first blows should be quickly and lightly delivered at the middle of the weld where the first contact is desired to occur; from this point the hammer blows should work quickly from the middle of the weld toward the ends and sides of the scarf or splice, the object being as welding proceeds to work the slag ahead of the welding and out of the joint. Frequent turning of the weld so as to hammer on all sides is necessary. With some experience gained the welding of comparatively light and short bars should not require the services of a helper.

The workman attempting to weld without a helper should first see that everything is at hand. Therefore, the hammer should be placed conveniently on the anvil for instant grasp. He should then determine which of the bars would be the more convenient to handle with the left and right hands respectively, having in mind that the bar which will be in the left hand must be employed in holding the remaining bar in position on the anvil when he releases it to use the hammer. No trust should be placed in the slight adhesion of the bars at the first contact.



A small area, A, outside the joint, is coated with solder, the melting of which serves as a guide to indicate when the solder in the joint is melted

RECENT DEVELOPMENTS in ACCESSORIES

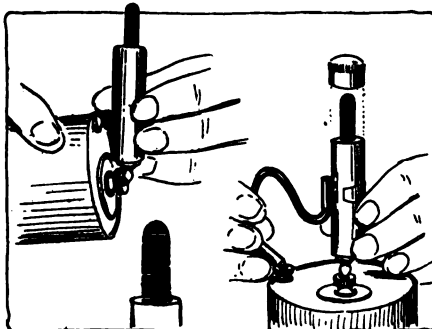
Benford's Monarch Ammeter

A battery testing ammeter operating on the principle of a solenoid and having but one moving part, a metal tongue sliding freely in a slot, is manufactured by the Benford Mfg. Co., Mt. Vernon, N. Y. Owing to the peculiar construction of the instrument it can be dropped and banged around without injuring it, as long as the metal tongue is not bent.

The ammeter consists of a metal cylinder with a pointed contact at one end while from the other end projects a strip of metal marked with amperes, up to 30, in white figures on a black ground; this end is protected by a cap when the instrument is not in use. A clip carries a short length of insulated wire with a metal tip.

There are two ways of using the ammeter. The contact point at the end of the case is placed on one of the binding posts of the battery and the end of the wire on the other post; the graduated tongue will rise to a height which will depend upon the amperage of the battery. The reading is taken from the figures nearest the top of the opening through which the scale rises. The other method is to dispense with the clip and wire and make the second contact by merely pressing the cylindrical shell of the ammeter against the second binding post of the battery; the result is the same in either case.

The Monarch ammeter is $3\frac{3}{4}$ inches long and $\frac{5}{8}$ inch in diameter and is easily carried in the vest pocket. The price is \$1.



Benford's Monarch ammeter, which is practically indestructible, and two methods of using it

Union Self-Healing Inner Tube

The Union Sales Co., Inc., Harrisburg, Pa., is sole distributor for the Union inner tube, which is so constructed that when a puncture is made it is immediately filled up air-tight; not only is the hole in the tube filled, but the hole in the casing is filled as well.

The tube is lined with a compound which consists of a tangled mass of fibers intermixed with a binder which is capable of forming an air-tight plug. The fibers used are sufficiently long to form a sort of mat of considerable stability, and are so interwoven and snarled that it is difficult to separate them without actually pulling them apart. If the filling should be worked out of a puncture a new one forms immediately.

All regular sizes are made. The prices of some of the sizes are as follows: 28 x 3, \$5.50 each; 30 x 3, \$5.70; 30 x $3\frac{1}{2}$, \$7.20; 32 x $3\frac{1}{2}$, \$7.60; 34 x 4, \$9.40; 36 x 4, \$9.75; 34 x $4\frac{1}{2}$, \$11; 36 x $4\frac{1}{2}$, \$11.35.

ber plate is attached. The device weighs 12 ounces. Price, 75 cents; dealers, 50 cents; jobbers, less than 100, 25 cents; 100 or more, 20 cents each.

MASCO

The Masco license bracket, manufactured by the Milwaukee Auto Specialty Co., Milwaukee, Wis., is designed for attachment to the cross-rod running from lamp to lamp at the front of the car. It consists of two arms which are clipped to the rod at the desired distance apart; the lower end of the arm is grooved for the cross rod and a short clamping piece, also grooved, is bolted on, the rod being pressed between them. Bolts, nuts and spring washers are supplied. Bracket arms are $4\frac{3}{4}$ inches long.

The price is 75 cents; each pair comes packed in a paper box. If it is desired to lower the position of the plate the arms can be attached pointing downward.

WHITEHOUSE

The Whitehouse-LeCompte Mfg. Co., Newark, N. J., produces license brackets in eight different models. No. 148 is a lamp-bracket license plate holder and No. 114-F is a rear plate holder, and both sell at the same price—50 cents. No. 145 is a front holder for Fords and is attached by the front spring clip bolts; two lugs are used, one on each side, slotted for the plate bolts; price, 30 cents per pair. No. 167 also is a Ford holder and also is attached by the front spring clip bolts, but it has two drop lugs, through which the spring clip bolts pass, and a bar running across from one lug to the other, to which the plate is attached; price, 50 cents. No. 156 and 156-A are clips for the front cross-rod and differ only in that the former is for $\frac{1}{2}$ -inch rod and the latter is for $\frac{3}{8}$ to $\frac{7}{16}$ rod; the price is the same in either case, being 20 cents. No. 152 is a special bracket for Overland cars, for attachment to the radiator cap, and No. 153 is a radiator cap bracket for oval necks; the price is 50 cents for either. No. 154 is another filler cap bracket and is made in three sizes— $1\frac{1}{2}$ -, $2\frac{1}{4}$ - and 3-inch; price, 50 cents.

BALZER

The license plate holder manufactured by the Gus Balzer Co., Inc., New York, is designed to be supported from the main frames of the car. There is a cross-rod, adjustable for length, which is clamped to the frames, extending across

INGENUITY AND VARIETY IN LICENSE BRACKETS

They Can Be Attached to Any Part of the Front or Rear of the Car

EBERHARD

The Eberhard Mfg. Co., Cleveland, O., manufactures license brackets in several styles. No. 9939, to fit on the lamp brace rod, is of the clamp type, the two grooved pieces being drawn together by a bolt and thumb-nut so that no tools are needed. The finish is black japan and nickel and the price \$2 per dozen. No. 9943 is for attachment to Ford headlights and is finished in black japan; price, 40 cents. No. 9940 fits on round radiator caps and is made in $1\frac{1}{2}$ - and 2-inch sizes; price in black japan, 58 cents; Nubia finish, 68 cents. No. 9941, for oval caps, japan, 66 cents; Nubia finish, 76 cents. No. 9945 is a rear

bracket with an offset lamp holder; price, japan, 64 cents; Nubia, 72 cents. No. 9938 is a radiator cap bracket, which is reversible, so that two plates can be attached and the one in use turned outward; price, japan, 60 cents.

REED

The Reed Co., Inc., Mayfield, Cal., manufactures a radiator cap type license holder that is of band steel with all joints electrically welded. A two-part clamp passes around the neck of the filler cap and is held by two small bolts. Two arms extending forward from the clamp carry a cross member which is slotted for the bolts by which the num-

from one to the other at the front of the car, and at the middle of the rod is a frame which is the plate holder proper. At the bottom of the holder are three stationary hooks into which the bottom of the plate is dropped. A single hook at the top is normally pressed downward by a spring and is fitted with a handle by means of which it can be pulled up while the plate is being placed, after which it is released and bears down on the plate, holding it firmly in position. Price, \$2.

SECURITY

Security rear license holders for Ford cars are manufactured by the Security Co., Pittsburgh, Pa. They are in pairs, one for each end of the license plate, and each consists of a two-part clamp for the rear axle. The body of the clamp, which has a projecting lug to which the plate is rigidly attached by means of a thumb-screw, is held firmly on the axle by a semicircle of steel which has a head on one end and a nut on the other. All nuts are fitted with spring washers.

Price, 50 cents; dealers, \$2.50 per dozen; jobbers, \$13 per 100.

APCO

A combined license plate holder and starting crank clip is produced by the Auto Parts Co., Providence, R. I. The license holder consists of a bracket which is attached by two nuts from the front spring clips, slipping the bracket over the bolts and replacing the nuts. The ends of the bracket are slotted to

take bolts to fasten the plate in place. The crank holder is a loop of spring steel wire which is held in place by the nuts which hold the license bracket; part of the wire is coiled to form springs which press the top of the hook against the crank and hold it up. The makers state that it does not interfere in the least with cranking and is almost invisible at a short distance. The devices may be used separately or together.

Price, 25 cents each; dealers, 25 per cent. The Apco rear bracket for Fords is so made that it lowers the number plate so that it cannot rattle against the body of the car; adjustment is provided to allow for variation in regular light brackets. Price, 35 cents; dealers, 25 per cent.

NEVEROUT

A wide range of license brackets is manufactured by the Rose Mfg. Co., Philadelphia, under the name Neverout. Two are of the filler cap type, having clamps for the neck held by two bolts and a slotted bar to which the plate is attached. Three sizes are made—No. 9 for moderate size caps. No. 9½ for caps under 2 inches, and No. 8 for extra large caps. No. 78 is for attachment to cross rod, and because it has but one clamp can be used on either straight or curved rods. No. 35 attaches to the front axle of the Ford car; No. 76 is for oval filler caps; No. 87 attaches to the Ford headlight bracket, and Nos. 22, 12 and O-21 are rear brackets. All the foregoing sell at the same price—75 cents. A cheaper line is also made, there

being six models selling at 50 cents each. These include No. 36, a filler cap type for cars with round fillers; No. 77, for oval fillers; No. 178, single-clip cross-rod type, for curved or straight rods; No. 62, combination tail lamp and license plate holder; No. 871, which attaches to Ford headlight brackets, and No. 621, a combination tail lamp and license holder for Fords.

Rapid Remover for Split Rims

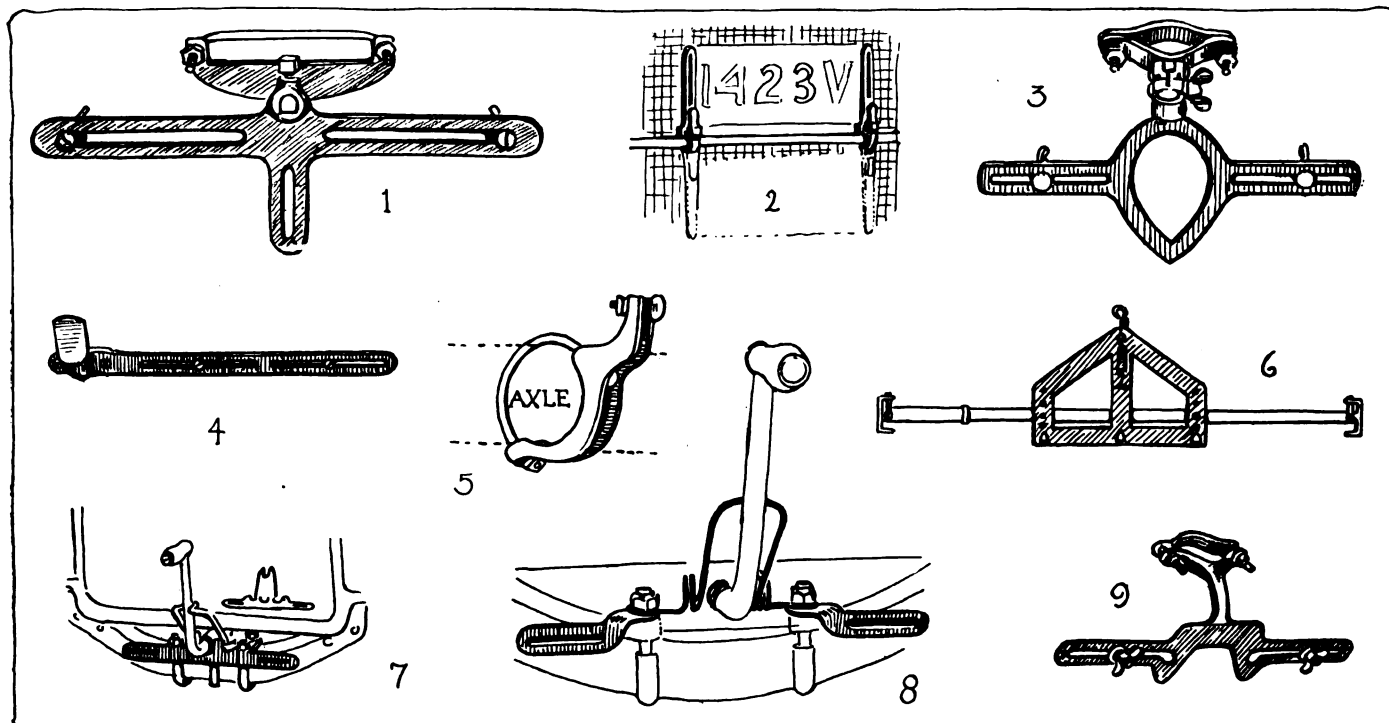
Rims of the type that are split and are collapsed for removal are easily and quickly handled by means of the Rapid tool, the product of the Rapid Rim Tool Co., Rochester, N. Y. The device consists essentially of two clamps, adapted to grip the rim, connected by a toggle mechanism with a lever.

To remove a rim the clamps are applied, one on each side of the split in the rim, and the lever swung downward. One part of the rim is lifted above the other and at the same time lapped over it; the rim can be collapsed from 1 inch to 8 inches, according to requirements. To replace the rim in its locked condition the process is reversed.

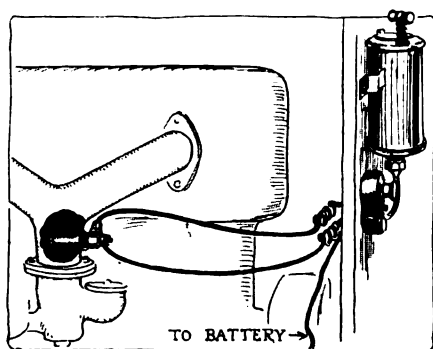
The price is \$2.50. Dealers, lots of 1 dozen, 40 and 5 per cent; in gross lots, 50 and 5 per cent.

Ideal Electric Fuel Vaporizer

With the object of robbing cold-weather cranking of its terrors the Ideal Brass Works, Indianapolis, Ind., has developed and marketed an electric gasoline heater and primer that is easily installed and is simple in operation.



Group of typical license brackets. (1) Whitehouse special Overland bracket. (2) The Masco holder will show either side of a two-faced plate. (3) Eberhard bracket for Overland cars. (4) Apco rear bracket for Fords. (5) Two of these clamps attached to the axle constitute the Security holder. (6) The Balzer device is adjustable for length and for the size of the plate. (7) The Unique and the Apco (8) combination holders for Fords support the license plate and also the starting crank. (9) Filler-cap type made by the Rose Mfg. Co.



Easy starting is facilitated by the Ideal electric primer for Fords

The heater and vaporizer proper consists of a small rod-like member which is screwed into the intake manifold directly over the carburetor flange, a hole being drilled and tapped for the purpose $\frac{1}{4}$ -inch standard iron pipe size. A copper tube connects the vaporizer with a small gravity tank on the dashboard. Four dry cells are wired to a terminal on the vaporizer through a dashboard switch; one of the battery leads is grounded. If the car is equipped with a storage battery it can be used as a source of current instead of the dry cells.

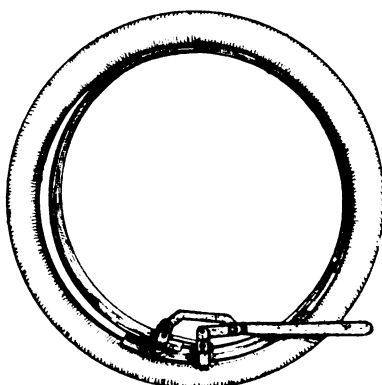
When the motor is to be started the valve at the tank is turned on and at the same time the switch on the dashboard is closed. By the time the driver gets around to the front of the car to crank there is sufficient gasoline vaporized by the heat of the current so that the engine will start easily even in the coldest weather, the makers state. Instead of the gravity tank, a small pressure pump can be supplied.

The price of the device, complete, is \$5; dealers, 50 per cent.

Savidge Ford Steering Device

An appliance designed to cause the front wheels of a Ford car to have a tendency to return to the straight-ahead position when deflected, and also to eliminate wobbling of the wheels on a rough road, is produced by the Savidge Steering Device Co., Indianapolis.

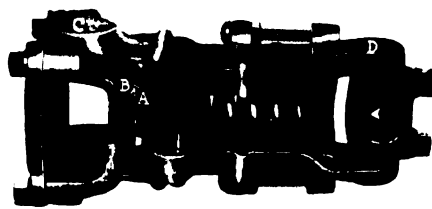
The device consists of a spring link



The Rapid tool for opening and closing split rims lifts and laps the ends

having one end clipped to the front axle at the middle and the other end, projecting backward, clipped to the tie rod of the steering gear. There are really three parts—the two ends carrying the clips and the middle part which encloses a heavy coiled spring and is attached to the ends by trunnions so that when the tie rod moves to one side or the other the trunnions permit the link to incline correspondingly.

The movement is resisted by the spring, one end of which—the end nearest the axle—is fitted with a roller which is pressed into a depression in the clip member when the wheels are pointing straight ahead. To incline the link it is necessary to force the roller to ride up the sides of the depression, compressing the spring and exerting force to bring the wheels back. As the spring is heavy, the lift is small and the wear and tear on the coil therefore slight.



The left end of the Savidge steering device attaches to the axle and the right end to the tie rod; trunnions C and D allow it to swing. Roller A is pressed by the spring into the bottom of the depression B with wheels straight

The pull of the spring is not excessive at any time; it is not exerted when the wheels are cut to the limit. The makers claim that the use of the device makes steering easier and more positive and saves a certain amount of tire wear by preventing wobbling when the road surface is uneven.

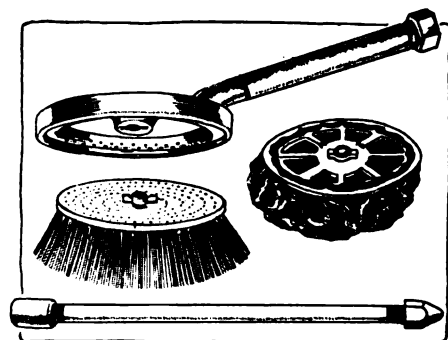
The only tool needed for attaching the device is a wrench, as it is secured by six bolts which can be put in place in less than ten minutes. The price to dealers is \$3.20.

Ford Steering Column Brace

For those who insist upon using the steering wheels of their Ford cars as handles to hoist themselves in and out, the Auto Parts Co., Providence, R. I., manufactures a brace which prevents the loosening of the flange bolts and the springing and possible breaking of the column. The brace extends from the dashboard to the column and is easily attached and when in place is out of the way. Finished in black enamel and sold complete with screws. Price, \$1; dealers, 25 per cent.

Tempco Fountain Brush

A washing brush that has a number of advantageous features is manufactured by the Tempco Mfg. Co., Chicago. The



Holder, brush, sponge and extension of Tempco fountain brush outfit

holder is so constructed that it will take either a brush or a sponge or, if there is a great deal of mud to be washed out, there is a specially designed nozzle that can be attached and used for the purpose.

The holder or back plate is of aluminum and the holes for the water, which enters through the hollow handle, are drilled on the inside of the rim and back and well distributed through the brush or sponge, as the case may be. A catch, something on the order of a bayonet lock, is used to hold the brush or sponge in place and is very easily operated. The nozzle, which is shown in the lower part of the illustration, can be used either as an extension of the handle or attached to the hose in the usual way.

Being of aluminum, the device will not rust and is light. The brush surface is $5 \times 6\frac{1}{2}$ inches; the handle is of corrugated rubber and is 6 inches long. The extension is 10 inches long.

The price of holder, brush, mud nozzle and handle extension is \$3.50. Rock Island wool sponge, 75 cents extra. Dealers, $33\frac{1}{3}$ per cent.

Nicholson Contact Dressing File

A file that is designed especially for dressing the contacts of vibrator coils and, for that matter, any other contact points that are liable to become pitted or worn in service, is manufactured by the Nicholson File Co., Providence, R. I.

The files are thin and the teeth are properly cut to dress contact points smoothly. They are fitted with handles; they are of uniform thickness, and the ends are beveled. They are mounted on cards or packed in boxes, a dozen on a card or in a box, and sell to dealers at from \$1.25 to \$1.50 per dozen.

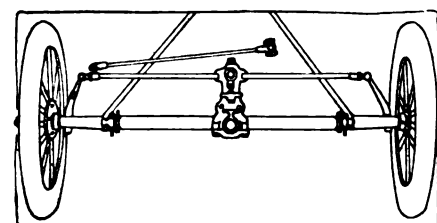


Diagram showing method of attachment of Savidge steering device

Jitneys Invading New England

Tendency in Ohio Toward Buses and Away From Touring Cars —Many Companies Start

New England appears to be adopting the jitney bus gradually but surely. Lines are operating in Portland, Me., and a company has been organized in Providence, R. I., which will begin operating this month. The cars will each seat 21 persons. Independent cars to the number of 200 are already licensed to run in the streets of Providence.

In Boston several buses have for some time been running between the Commonwealth Fish Pier, South Boston, and the foot of State street, on Atlantic avenue. The district about the pier has no convenient electric service. There are two Velie buses, of the front entrance prepayment type, each accommodating 18 persons. Trips are made on a 20-minute schedule, the distance being about a mile. The fare is 5 cents and the running time seven minutes. As many as 400 passengers a day per car have been carried. Besides the two Velies there are three Autocars, accommodating 8 to 12 passengers.

Time Schedule Necessary

These cars also make trips at 20-minute intervals, or more frequently during rush hours night and morning. The peak load comes at about 5 P. M., when employes at the docks and fish houses return home from work. The regular trips of all the cars begin at 6 A. M. and continue up to 6:30 P. M.

At Lynn, Mass., five large motor buses are in regular operation on fixed routes, each one paralleling street car lines. Each route is about 2 miles long and the fare is 5 cents. Central square, near the Boston & Maine railroad station, is the starting point, and the buses run to Swampscott, Myrtle street and Hudson square. There are three 19-seat Federal cars, a 16-seat Autocar, and a 19-seat Universal. All the vehicles are operated individually, each by its owner.

Average 3,000 Fares a Week

One operator reports that 3,000 passengers a week is about the average number of fares on each of the vehicles. The daily run in each case is about 90 miles, or 20 to 22 round trips.

All the cars operate on about the same daily schedule, viz.: 6:30-8:30, 11:30-2:30, and 4:30-8, trips being arranged to catch the rush of shop workers from home to factory and return.

Heretofore the street railway company had run its cars on 15 minutes' time, but the advent of the motor bus has caused

the management to increase the schedule to a trip every 5 or 7½ minutes.

In regard to the proposed legislation looking to the supervision of the motor bus by public authority, some operators welcome proper regulation as a means of keeping irresponsible and careless operators from entering the field, while others believe such a measure would seriously affect their business.

Affect Street Car Profit

Besides the cities mentioned, automobile buses are also operated between Greenfield and Turner's Falls, Mass. Here their route does not parallel the street car line. It is said the street railway business between the two towns has been seriously affected by the competition of the buses. It is the practice to make trips in the interval between regular trips of the street railway company, which is half-hourly.

Ohio Taking to Larger Cars

Another successful line is being operated between Salem and Peabody, Mass. Here two cars make a circuit, every trip in the opposite direction from the last.

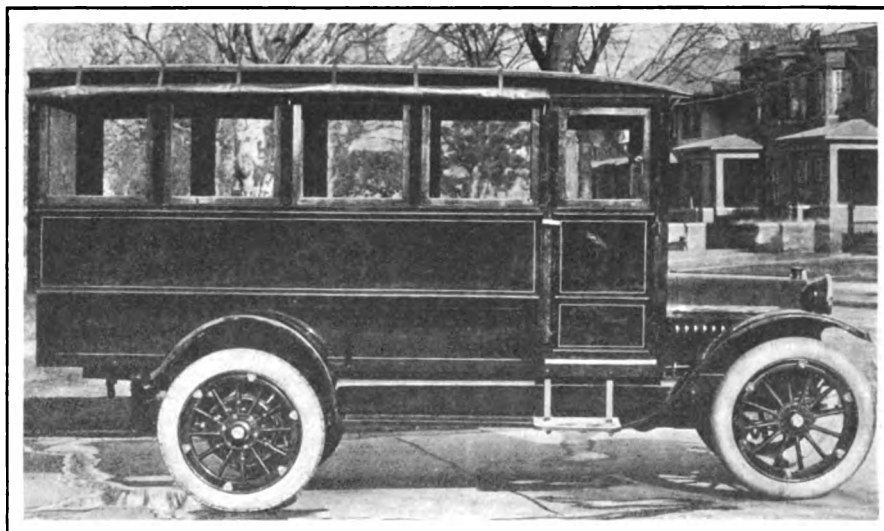
The tendency of the jitney development in Ohio during the past few weeks has been towards buses rather than touring cars. When the fad first appeared, a large number of touring cars were employed in the service, but these generally have been operated on an unprofitable basis. In other words, the fad is fast disappearing and in its place is appearing a plan of operation which would imply some profit to the promoters.

Capacity from 18 to 30 Passengers

To that end larger vehicles have been secured or are contracted for. Cars carrying from 18 to 30 passengers soon will be put into service in many of the larger cities in the Buckeye state. This is especially true of Cincinnati, where the John J. Radel Auto Garage Co. has contracted for 10 buses capable of carrying 24 passengers each. They will be put into service from Fountain square to Price Hill. In Cleveland the plan is to employ larger vehicles and thus increase the carrying capacity. The same movement is seen in Toledo.

In Columbus the fad is rapidly subsiding. There are still a few touring cars in operation, but the business has not been the most profitable since its inception. One car is being operated with a bus body.

TYPE OF JITNEY THAT IS GAINING IN FAVOR



Fourteen passengers can be seated comfortably in this new Studebaker bus. Entrance and exit are by the front door only, which is on the right side and is controlled by an opening and closing lever in front of the driver, who sits on the left.

The body is carried on sills placed both lengthwise and crosswise of the chassis. There is a 16-inch step up to the floor. A sanitary floor of wooden grids covers the floor of the body. All seats are leather upholstered, 16 inches deep, and the backs are 18 inches high. The body is 60 inches in inside width, which gives ample knee room for all passengers.

Electric dome lights give a brilliant illumination at night and the windows may be removed in pleasant weather. The driver's window is clear vision, rain vision, and ventilating.

The standard Studebaker four motor of 3½ inch bore and 5 inch stroke is used. The Studebaker-Wagner electrical system, the Willard stor-

age battery, the Remy ignition, and the Studebaker carburetor are the chief motor accessories. A 25-gallon gasoline tank is carried in the rear, and feeds to the carburetor through the Stewart vacuum system. Larger Timken bearings are used throughout the chassis. There are two of these extra bearings in each of the four wheels, three in the transmission, and two in the differential, making thirteen in all.

Additional size and strength have been given the floating rear axle, as compared with that of the other Studebaker cars. The gear ratio to the rear axle is 4.6 to 1. Radius rods and torque arms of increased size relieve the springs of driving and awing strains.

The tires are Goodrich 35 x 5 with a spare tire on the side. The bus is finished in an olive green with red wheels. With complete equipment of tools, electric starter, electric lights, and one spare tire, it sells for \$1,235.



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Garagemen Merchants?

Ann Arbor, Mich., March 26—During the last few months hardware stores in many towns of this and other states have added motor car accessories to their stocks.—News Item.

THIS, in brief, tells the story of how the altogether live hardware merchant is cutting into the garageman's legitimate field. He is selling spark plugs, wrenches, pliers, and, in a notable number of cases, tires even, right under the nose of the garageman and in the face of a handicap with which the garageman never has to contend.

Why? One reason is adequate display. The average hardware merchant in even the smallest towns is thoroughly alive to the possibilities of merchandise well displayed. He has all his goods out on the counters or well displayed in show cases, where everyone who enters his store can see them, and seeing them remember that he wants them. His windows are tastefully arranged and the merchandise in them is frequently changed.

The Hardwareman's Foresight

Why? Another reason is that the hardware merchant foresees the demand that spring touring will bring for motoring necessities that must be purchased somewhere. Hence, he stocks spark plugs, wrenches, pliers, and in some cases, tires. And also, he sells them.

The handicap under which the hardware merchant works is this: When the motorist goes to his store for some article, he goes there solely because he wants

that particular article. There is no other inducement for him to enter the store.

But there are 101 reasons why a motorist will enter a garage. He may want gasoline or oil; he may store his car in the garage and so be in it twice a day. Hence the garageman has everything in his favor for the sale of accessories.

Adequate Display the Answer

IF THE MOTORIST KNOWS THAT THE GARAGEMAN SELLS SUPPLIES—AND THE BEST WAY TO LET HIM KNOW IT IS TO DISPLAY THEM WELL—HE IS FAR MORE LIKELY TO PURCHASE FROM THE GARAGEMAN THAN DELIBERATELY TO LEAVE THE GARAGE AND PURCHASE HIS SUPPLIES FROM THE HARDWARE MERCHANT IN THE TOWN.

A small show case costs little. A small stock of such supplies as every motorist requires sooner or later costs little more. And here is the beginning of an adjunct to the business that in a short time should not only pay for itself but in time should prove profitable.

But in the meantime, the hardware merchant is living on the profits that belong rightfully to the garageman. What about it?

Suggestions

WITH the object of ascertaining what differences, if any, exist between dealers and manufacturers and in the belief that these would be on the way toward a remedy if the light were thrown upon them, Motor World has asked of a certain group of dealers what improvements they would suggest in the relations between the dealer and the maker.

That this might be of greatest value the questions were confined to a certain area—the State of Iowa. The answers revealed interesting points, and are told in a story on another page. The dealer does not always want more commissions, even if the desire for more money is a human trait. There are other things which generally he would like to see corrected.

Such things as price-cutting and price maintenance; the necessity of doing business through a middleman as the present merchandising arrangement demands; the elimination of the overhead-less curbstome dealer, and other things which are closely allied with the transaction of the dealer's business are to the dealer more important than the matter of a bigger discount. His attitude is: Give me a fair shake and I'll take care of the profit part of it.

To this story we call the attention of every one who has any interest in the welfare of the industry. Some of the suggestions for improvement may not be crying abuses; in individual instances they may be dire troubles. They are not confined to any one make of car, and the remarks of the dealers are not neces-

sarily aimed at the makers of the cars they sell. The suggestions are general.

Is there room for improvement? If so, what can be done?

Time-Saving Methods

THE transmission of orders and memoranda from one department of a service station or salesroom to another part more or less distant has caused more than one person to scratch his head in perplexity. It is a problem that has been attacked in more ways than one, yet none seems simpler than the way in which a New York dealer, whose story is told on another page, has attacked it.

Time was the big factor in this case. The nature of the business is such and the layout of the building so arranged that many messages and orders must be transmitted from one floor to others. The pneumatic tube system suggested itself to the manager of the station, but upon investigation the cost proved prohibitive.

Where Ingenuity Saved Money

But even this obstacle was surmounted by having the necessary apparatus built right in the service station. A few lengths of seamless steel tubing were purchased; the valves were constructed of odds and ends; a leather carrier or two were purchased from a harness maker, and the system was complete. For power, air from the tanks used for tire inflation is used.

The net result of the experiment is that a great amount of time is saved in the transmission of messages between the various departments; the workmen are not disturbed by the necessity for doing messenger service—and the manager of the service station saved about \$200, the difference between the cost of having such a system installed and making it himself.

Spring Cleaning

THE need for a new, stiff broom in more than one repair-shop is very real and very urgent. If, as the old saying tells us, "Cleanliness is next to godliness," it is also next to efficiency. It is impossible to do good work, and to continue doing it, with lathe cuttings, grime, dirt and discarded spare parts littering the floors.

In one garage we recently visited, lathe turnings and sweepings from the floor were piled beneath a work-bench in such a way, and there was such a great quantity of this, that it was impossible for the workman to stand close to the bench.

Not only does an accumulation of dirt, discarded parts, etc., reduce the efficiency of the shop by getting in the way of everyone, but it also encourages poor workmanship. It is like a millstone around any garageman's neck. It will drive trade from his door.

Why not a spring cleaning campaign?

Do You Do It?

LITTLE things in salesroom conduct mean much; their aggregate constitutes the attitude of your business to that great big money-spending public which helps pay your rent. If your clothes were all pressed with the exception of one coat sleeve and if all other parts of your exterior adornment were in good appearance you doubtless would be classed as a neat man.

But if the rest of your outfit matched the sleeve it would be something else again. This week Reilly touches upon the single small matter of salesmen—and proprietors, too—sitting upon desks in the salesroom and assuming generally unbusinesslike and ungentlemanly attitudes.

It is such a little thing, it is true; a few minutes of sitting on a desk may mean nothing—provided it is an unpressed sleeve in an otherwise well-kept suit. But the point is this: Would the man in the well-pressed suit leave the sleeve unpressed?

Upon the correcting or continuing of such a single small habit may rest the backward or forward progress of a whole business.

Window Expenditures

WINDOW display and the value derived therefrom is like many other lines of endeavor; what you get out of it depends upon what you put into it. There is no question but that it pays.

Elsewhere in Motor World this week there appear two pages of pictures and a story on the window display work of a Boston dealer; that the display is elaborate cannot be denied, and that it pays this dealer cannot be denied when he himself asserts that all he has put into window work has been a good investment—and he has put much money into it.

Fixtures for Many Uses

His display equipment—for the window or salesroom—includes such things as brass tubing fences, hanging trough lights, rugs of several colors, immense flower vases and similar properties; the first cost of these was not small, but they have been used many times in varying forms. His latest venture—the theater window—required some new properties, but many of those which appear in the display are devices which have been used many times in other forms.

Spending money to get more money is a quicker way than spending little and believing it is economy; spending it foolishly is folly, and judgment is required in the expenditure. A theatrical window of this sort would cost more than some smaller dealers might care to pay for a display, but it is not out of place in this salesroom. The proprietor, John H. Johnson, has built up a big business by just such methods—and he is still building.

Dealer Supply House

The RETAIL NEWS



Garage Repair Shop

Lewis H. Hall, Wausau, Wis., who established Hall's Garage in 1907 and is a pioneer in the motor car business of northern Wisconsin, has established a wholesale business in connection with his agency garage and supply business and intends to operate the largest business of its kind in his territory. The campaign will be directed particularly on tires and Saxon cars, five traveling representatives being employed for this purpose.

J. H. Wagner, during one and one-half years with the Saginaw Hudson Sales Co. and then during four years with the Saginaw Auto Co., has started in business for himself. He is a practical repairman and has made a specialty of electric lighting and starting systems. His headquarters are with E. L. Black, agent for the Dodge cars, West Genesee and Fayette.

The Lavier & Long Electric Co., which operates a garage at 18 Bagg street, Detroit, has been fitted up as a service station for Helios batteries. This is one of the first of thirty stations to be opened by the National Carbon Co., which makes the Helios storage battery.

Bert Maudlin, who has conducted a garage in leased quarters at Ripon, Wis., for several years, will erect a permanent home of fireproof construction at once. It will be two stories, 44 x 46 feet. A motor livery will be conducted.

Myers-Ebersole Motors Co., Kansas City distributors for Regal cars in Kansas and Missouri and which in the past has been located at 1716 Grand avenue, is moving into a new building at 1821-23 McGee street.

Herman Babcock, who is operating a garage at Webster, Wis., with his brother, Charles A. Babcock, contemplates the establishment of a garage in Grantsburg, Wis.

Waters & Miller, Kendall, Wis., who contemplated the erection of a large building to serve as a garage, machine-shop and amusement hall, have changed their plans and will erect only a garage and shop.

W. E. Bullard and Fred Bullard have

established an electrical supply and service store at Neillsville, Wis., and will conduct a tire selling and repair department, equipped with steam vulcanizing machinery.

J. Hamacheck & Son, Two Rivers, Wis., are taking bids for the erection of a new garage and repair-shop building, to be of fireproof construction, 60 x 120 feet, one story high, and cost about \$10,000.

The Inter-State Motor Co. has entered the trade in Philadelphia, at 2005-9 Oxford street, handling the Inter-State. The proprietors are Leonard & Colberg. They distribute through nine counties.

Kuntz Bros., proprietors of the Juneau Auto Livery at Juneau, Wis., have sold a half interest to Fay Ellis, former under sheriff of Dodge county, and will add several new cars to their equipment.

Jensen & Flack, Lake Geneva, Wis., have started construction work on a new garage and machine-shop building. The structure will be of fireproof construction, two stories, 50 x 100 feet.

The Baker Garage & Supply Co., Saginaw, which has been dealing in accessories and supplies on a small scale, has now installed a very complete department in charge of Bert Smith.

Philip Slocum, operating a garage at Oshkosh, Wis., has filed a voluntary petition in bankruptcy, scheduling liabilities at \$1,156 and assets at \$219.50, of which \$200 is declared exempt.

G. R. Krueger and F. H. Peterson have formed a partnership to conduct a garage and repair-shop under the style of The Auto Inn. A steam vulcanizing plant will be installed.

Oscar Olsen, Sawyer, Wis., has moved to Sturgeon Bay, Wis., and will establish a repair-shop and will do repainting, trimming, and operate a storage department.

The Terrace City Motor Car Co., Yonkers, N. Y., is having plans prepared for a storage building and repair-shop to be erected at 350 South Broadway.

A. R. Manley, agent for the Ford and

Allen at Montfort, Wis., has been awarded additional territory and will establish a branch at Fennimore, Wis.

The Chattanooga Auto Co., Chattanooga, Tenn., has just installed a complete motor-generator equipment for charging storage batteries.

The Saxon Motor Sales Co., Columbus, O., Saxon distributor for Central Ohio, has leased new quarters at 138 East Spring street.

The Jeffersonville Motor Co., Jeffersonville, O., dealer in that territory for the Studebaker, has recently completed a new brick garage.

Ross & Pittsley, Wheeling, W. Va., have opened a repair-shop at 8 South Huron street. They also operate a taxicab service.

The L. E. Sliger Auto Supply Co. has started in business at 120 West Main street, Battle Creek, Mich., dealing in accessories.

The Edson Motor Car Co., Bethany, Mo., which handles the Studebaker, is contemplating a new brick garage, 90 x 120 feet.

R. H. Suettinger, Two Rivers, Wis., recently appointed agent for the Buick, will erect a garage and salesroom on 16th street.

The Guarantee Vulcanizing Co., Grand Rapids, agent for Miller tires, has moved into new quarters at 210 Ionia avenue.

Howard Lane and Robert Farmer have opened a garage under the style Fix-it-Garage Co., in Saranac Lake, N. Y.

Walter Krouse and Castello Marshall have formed the Ludington Tire and Vulcanizing Co., Ludington, Mich.

Louis Boomhower, who has an accessory business in Battle Creek, will open a branch in Marshall, Mich.

The Jones Auto Co., Akron, has started excavation for an extensive addition to its garage.

E. C. Bolt will open a garage and harness store in Bancroft, Mich.

E. L. Stanley & Son, Sebring, O., will soon erect a new garage.

Washington (Pa.) Dealers Stage Parade

Immediately preceding the inauguration of the first Washington, Pa., Spring Style Show, the motor car dealers paraded their newest and shiniest cars through the business streets, some 38 vehicles, representing 20 different makes, taking part in the parade. C. B. McAlister, of the McAlister Auto Co., headed the procession in a Cadillac eight, the other dealers in the line including:

Washington Auto Co., Hudson, Oldsmobile and Studebaker; T. C. O'Rourke, Overland; Mansfield

Auto Co., Chalmers and Reo; Keystone Garage, Buick; Standard Auto Co., Mitchell and Hupmobile; D. P. Hart Auto Co., Paige and Allen; T. H. Sutherland, Chevrolet; H. L. Robinson, Haynes; W. A. Watson, Franklin; Hall Avenue Garage, Oakland; I. C. Patsch & Son, Apperson; John B. Kelly, King.

Van Sicklens On All Hupmobiles

The Van Sicklen Co., Aurora, Ill., has closed a contract with the Hupp Motor Car Co., Detroit, to use the Van Sicklen speedometer as stock equipment on Hupmobiles.

Newark to Stage a Pageant

Newark, which is in New Jersey, is to have an illuminated pageant on the night of Saturday, April 10. The parade will be made up of six sections, including pleasure vehicles, gruesquely decorated cars, municipal vehicles, commercial vehicles, motorcycles and floats. There are to be prizes for individual owners and for dealers entering the most artistically decorated cars. Headquarters have been established at 845 Broad street, Newark.

PLANS TO BUILD CHASSIS FOR USE OF ASSEMBLERS

Pontiac Chassis Co. Will Put Out Production on European Plan—

Buyer Fits Up to Suit Himself

The Pontiac Chassis Co., Pontiac, Mich., a new concern whose incorporation was announced last week, is to build for the automobile trade chassis minus bodies and tires. The customer receives the chassis in this form, mounts his own design of body and top, puts on the tires, and then sells the completed car under his own name. The chassis is built for assemblers only, and it is stated that by this method the small assembler is enabled to produce a car at as low a price as the larger manufacturer.

The incorporators of the new concern with this unique manufacturing plan are R. A. Palmer, of Pontiac, formerly general manager of the Cartercar and Oakland companies; Robert Perkins, secretary of the Massnick-Phipps company, maker of eights and four-cylinder motors in Detroit, and H. H. Brooks, former sales manager of the Marathon Motor Works, Nashville, and later of the Herff-Brooks Corp., Indianapolis. The authorized capitalization is \$100,000, and it is said that other Detroit and Pontiac capital is interested in addition to that represented by these principals.

The first design of chassis to be produced by the company, which is doing its assembling in the plant formerly occupied by the Flanders Mfg. Co., is a 25-horsepower type using the Perkins small four-cylinder engine, which has a bore and stroke of $3\frac{1}{4} \times 4\frac{1}{2}$ inches. It is an L-head engine with cylinders in a block and three-speed gearset in unit.

There is nothing unusual about the chassis or its power plant, conventionally accepted practice being adhered to in its construction. The specifications include a floating rear axle with annular ball bearings and roller bearings, this being a Salisbury unit. The wheelbase is 106 inches; pressed steel frame construction is followed with a taper to the front; the front springs are semi-elliptic, while the rear set are of cantilever form, attaching at two points to the frame and shackling to the rear axle. The drive is by the Hotchkiss method, whereby no radius or torque rods are used, but the drive is taken through the springs. Accordingly, the drive shaft is unenclosed and has a universal joint at each end.

The chassis buyer is offered options in ignition—either Atwater Kent distributor system or a magneto. Also it can be furnished either with or without an electric starting and lighting equipment.

The wheel equipment is another point

where the assembler is given an option. Wood wheels, 28×3 , 30×3 or $30 \times 3\frac{1}{2}$, with or without demountable rims, are obtainable.

A feature of the Perkins engine with which the chassis is fitted is the use of a single casting for both the intake and exhaust manifolds. This serves as a vaporizing agent for the incoming gases and aids in the clean outward appearance of the power unit. Valve, carbureter and manifolds are on the left side.

The chassis, as it comes to the car assembler, is also fitted with a cellular radiator, has the gasoline tank suspended at the rear of the frame, and running-board brackets, lamp brackets, etc., are in place.

It is stated that in addition to the chassis above mentioned, the concern expects to market a larger size as well.

NEW YORK TRADE OPPOSES NEW LICENSE EVERY YEAR

Representatives of the automobile trade in New York City have taken exception to the proposal of the Municipal Explosives Commission to compel garagemen, dealers and others affected by ordinances of the so-called hazardous trades to take out a new operating license each year. One issuance, with power to the commissioner to revoke for cause following a hearing, is the trade's recommendation.

President R. H. Johnston, Manager Charles A. Stewart and Attorney Charles Thaddeus Terry of the Automobile Dealers Association of New York City, appeared at a hearing last Friday, March 26, on the proposed ordinance. This ordinance is part of a codification and revision of all existing ordinances applying to hazardous trades; later there will be added a chapter applying exclusively to the motor car trade.

Gibson Leaves Gibson Company

Cecil Gibson has disposed of his interests in the Gibson Automobile Co., Indianapolis, and the Empire Automobile Co., to become the head of the Madison Motor Co., with plants at Anderson, Ind., and Berlin, Canada. The company will be incorporated within the next week for \$500,000 and Gibson will assume the office of president and general manager. He is also the largest stockholder. Associated with Gibson will be Henry Nyberg, W. E. Moore, C. F. Wood, of Washington, D. C., and Tom Forbes.

It is the intention of the company to build a four-cylinder car that will market for about \$750. The wheelbase will be 112 inches and the motor will be of 30 horsepower. It is also the intention of the company, beginning July 1, to build an eight-cylinder motor. Preparations for the eight are under way.

FOUR HEAVY CARRIERS IN NEW UNITED MOTOR LINE

Two, Three, Three and One-half and Five Tons With Worm and Chain

Drives Made by Kansas

City Company

Formed in the early part of February, the United Motor Truck Co., Kansas City, has just announced its complete line of trucks, which consists of 2- and $3\frac{1}{2}$ -ton worm-driven trucks and 3- and 5-ton chain-driven models. The price of the 2-ton model is \$2,050, of the $3\frac{1}{2}$ -tonner \$2,950, of the 3-tonner \$2,750, and of the 5-ton model \$3,400.

All models are assembled from parts of well-known makers. The worm-driven models are similar, having Continental $4\frac{1}{8} \times 5\frac{1}{4}$ and $4\frac{1}{2} \times 5\frac{1}{2}$ motors, driving through dry-plate clutches and three-speed selective gearsets of Brown-Lipe make incorporated with the motor units and tubular shafts with two Spicer joints to Timken-David Brown worm-driven axles. The 2-tonner has a 148-inch wheelbase with 34×4 tires in front and 36×4 dual behind. The $3\frac{1}{2}$ -tonner is offered in a standard wheelbase of 144 inches, with options of 120, 168, 192 and 216-inch lengths at extra cost. Tires on this model are 36×5 in front and duals of the same size in the rear.

The motors of the chain-driven models are $4\frac{1}{2} \times 5\frac{1}{2}$ Continentals on both models, incorporated with Brown-Lipe clutch and gearset units and driving through Timken jackshafts, whose feature is a torque arm similar to the type employed on some shaft-driven vehicles. The 3-tonner has the same wheelbases and tire sizes as the $3\frac{1}{2}$ -ton worm-driven model. The 5-ton model is furnished in a 120-inch wheelbase as the standard with longer wheelbases optional. The tires are 36×5 in front and 40×6 duals behind.

Winton Chauffeur Contest May 1-Oct. 30

The eighth annual Winton Motor Car Co. repair expense contest will start May 1 and end October 30. Cash prizes amounting to \$3,500 will be paid the 25 chauffeurs making the best records. Also, the best record made by a "New Size" six will win for its owner a brand-new car in even exchange for his old one. If prior to October 30 any contestant has driven 12,500 miles, his effort ends at that point; he will not be required to continue. This is to equalize chances. First prize will be \$500; second, \$400; third, \$300, and fourth, \$200. Sixteen prizes of \$100 each and five district prizes of \$100 each will be awarded. District prizes will be awarded for the best remaining record in each of five sections, after the first twenty have been awarded.

PROMINENT MEN OF TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve to Place Many Workers in New Places—Few of Them Leave the Industry

E. H. Wagner has become secretary-treasurer of the E. M. Owens Sales Co., Indianapolis, distributor for the Detroit.

W. L. Chilman has been appointed manager of the Detroit branch of the Regal Motor Car Co., at 758 Woodward avenue.

J. R. Histed has been appointed manager of the New York branch of the J. I. Case T. M. Co. He succeeds O. A. Lewellen.

J. B. Seigfried, who was purchasing agent for the King Motor Car Co., Detroit, has been appointed production manager and superintendent of purchases.

Ernest L. Smith has been made sales manager of the Russel Motor Axle Co., North Detroit. Formerly he was western representative of the R. I. V. Co.

H. F. Loechler, formerly connected with the Ohio Electric Co., Columbus, O., has been made manager of the electric department of the Standard Motor Car Co., Columbus.

A. C. Dilger has been advanced from the Parts Order Department of the Studebaker factory at Detroit to take charge of parts and claims at the New York branch, effective April 1.

W. W. Austin, who has been superintendent of service, parts, machine and experimental work in Detroit, has been made general superintendent of the Studebaker South Bend works.

W. R. Cavanagh, who has been in charge of the methods department of the Studebaker Corp., Detroit, has been appointed assistant general superintendent of the Studebaker works at South Bend.

Fred I. Huntington has been appointed city sales manager for the Seidner-Merritt Co., Cleveland distributor of King cars. Formerly he was connected with the Cuyahoga Sales Co., Chandler dealer.

F. S. Komp, formerly manager of the Lehigh Valley Structural Steel Co., has gone to Brooklyn, N. Y., where he is the head of the Lansden Automobile Co., manufacturer of electrically propelled vehicles.

W. J. Slater has resigned as assistant sales and advertising manager of the motor car department of the Durant-Dort Carriage Co., Flint, to join the sales organization of the Firestone Tire & Rubber Co., Akron.

T. C. Woodwin, formerly of Detroit,

Mich., has been appointed district sales manager for the states of Kansas, Missouri and Nebraska by the Lewis Spring & Axle Co., Jackson. He will have his headquarters in Kansas City.

A. C. Jones, formerly manager of the Dayton (O.) branch of the Pyrene Mfg. Co., has been appointed manager for the company in Indiana and has opened a sales and distributing branch at 345 No. Capital avenue, Indianapolis.

L. E. Kennedy has resigned as secretary, treasurer and general manager of the Western Brass Co., Milwaukee, and returned to Burlington, Wis., his former home, to engage in business on his own account. No successor has as yet been selected.

Charles H. John, president and general manager of the Wisconsin Motor Mfg. Co., Milwaukee, was elected first vice-president of the Milwaukee Metal Trades & Founders Association at the annual meeting last week.

Houk Buys American Spoke

BUFFALO, N. Y., March 30—Geo. W. Houk, of the Houk Mfg. Co., has purchased the plant of the American Spoke & Nipple Co., Detroit, and will move all the machinery from it to the Buffalo plant. The American company has a capacity of 25,000 spokes and nipples per day and at the present time the Houk company is using 30,000 per day.

Puritan Machine Gets Krit Parts

DETROIT, MICH., March 30—The Puritan Machine Co. has purchased from Samuel L. Winternitz & Co. at public auction the parts and accessories which formed part of the assets of the Krit Motor Car Co. and the Krit Sales Co. The Puritan company will supply parts.

G. M. C. Discontinues Detroit Branch

DETROIT, MICH., March 30—J. C. Ayers, who was in charge of the Detroit branch of the General Motors Truck Co., will become assistant sales manager at the factory in Pontiac. The Detroit factory branch will be discontinued April 1 when the sale of G. M. C. trucks will be taken over by the Standard Auto Co., which also has secured the agency for Republic trucks.

Kansas City Jitney Convention

KANSAS CITY, MO., March 26—The Kansas City Jitney Association has called a national convention of all those interested in the jitney movement, to be held in this city, May 4, 5 and 6, at which time an interchange of views on such points as legislation, insurance, safety in operation, licensing of drivers, equipment, and every other question relative to the jitney movement can be discussed. The call for the convention has resulted from the many letters received by the Kansas City Jitney Association.

STEINMETZ HELPS OUT CHEAP CAR PREDICTION

Taking Part in Perfection of a Simplified Power Plant—Incorporated in Axle With Minimum of Gears

A little less than a year ago Dr. Charles P. Steinmetz predicted the coming of 1,000,000 cheap electric cars to take care of the bulk of motoring in cities.

It seems that matters are not being left alone by Dr. Steinmetz to develop by themselves, but that he will take an active part in the production of the vehicles necessary to fulfill his prophecy since he now announces the existence of a simplified power plant which is being perfected under his direction, and which he expects will play an important part in the difficult task of cutting down the cost of making an electric car.

Briefly, the new device consists of an axle design incorporating the motor, and with a minimum of gearing, this leaving merely the controller and battery to be mounted on the car itself. It is realized that one of the manufacturing difficulties which have faced electric car makers is the big gear reduction necessary between the fast running motor and the road wheels. In the new apparatus this is cut in two by the simple means of allowing both parts of the motor to revolve, the armature in one direction and the field magnets in the opposite. This gives a shaft speed for armature or fields of 1,500 r. p. m. when the relative speed of fields and armature is 3,000 revolutions. In the complete axle design the motor is located centrally but its axis is not in line with the tubular drive shafts that carry the road wheels; it is parallel thereto but about an inch above them. On the end of one drive-shaft there is an internally toothed ring and meshing with this is a pinion on the armature shaft, but on the other side, the field magnets carry the ring gear and the pinion is on the drive-shaft. This means that rotation of armature and fields in opposite directions will cause the road wheels to revolve in the same direction, either forward or backward, according to the direction of the current.

Since one driveshaft is in connection with the armature and the other with the fields there is no direct mechanical linkage between the shafts—no differential, that is. Instead, the armature can slow down while the fields speed up or vice versa, so that a corner can be taken by slowing one member and accelerating the other.

While this arrangement eliminates certain mechanical parts and might therefore be made more cheaply than the usual motor and drive, it is claimed that greater saving is also introduced by simplification of the car frame which has no driving stresses to resist but is merely a weight carrier. Also, the controller is arranged so that the motor becomes a dynamo when running down hill and puts a small charge back into the battery; though it is not suggested that this would serve greatly to increase the radius of the vehicle, it might easily add a few per cent to the miles obtainable from one charge.

Warren D. Oakes, president of the Oakes Co., Indianapolis, has been elected general secretary of the Indianapolis Chamber of Commerce. Fred I. Willis, of the Hershey-Willis Co., was elected president.

FITZGERALD MAKES CUTS IN PRICE OF CLERO HORN

One Dollar Less For Each—Hand Signal Now Lists at \$3.50—Long Projector Type Reduced to \$4.00

The Fitzgerald Mfg. Co., Torrington, Conn., has reduced the price of its regular type Clero hand-operated warning signal from \$4.50 to \$3.50. At the same time the price of the extra long projector model has been reduced from \$5 to \$4. The regular model is finished in black with a nickel bell, and the extra long projector has black finish with the rim of the bell nickeled.

Both signals are of the type in which the operating lever is vertical, the horn being operated by depressing the lever. The supporting bracket is substantial and is so arranged that the attachment of the horn requires but three screws and can be made easily.

Garagemen Prepare to Buy

Cooperative buying of garage supplies in order that the garagemen may get the benefit of quantity discounts is the object of the Association Products Co., which is an alliance of three Illinois garagemen's associations. According to President Halbert of the Chicago Garage Owners Association, the new company will do the purchasing for his organization, for the Garage Owners Association of Illinois, and for the Associated Garages of America. The first step in the direction of buying their own supplies is the decision made last week to purchase all the oil through the Association Products Co., which now is receiving bids from refiners. The company has a staff of experts engaged in preparing specifications to which any oil purchased must conform.

Final Dividend to Warren Creditors

The liquidation of the affairs of the bankrupt Warren Motor Car Co., Detroit, ended a few days ago and a final report has been mailed to the creditors and stockholders by the Detroit Trust Co., which acted as a receiver. A final dividend of $2\frac{3}{4}$ per cent was allowed by the court and is being paid. The total dividend paid to the creditors is $22\frac{1}{4}$ per cent.

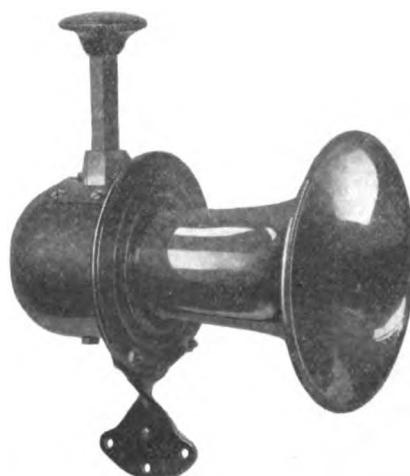
Dissatisfied With A. A. A. Control

CHICAGO, ILL., March 30—The International Motor Contest Association has been formed as the result of the dissatisfaction of the American Association of Fairs and Expositions over the manner in which the American Automobile Association controls dirt track racing. This new body was brought into being

yesterday at a meeting of the committee appointed by the Fair association to investigate the feasibility of starting an organization which should control racing at the county fairs. It is claimed that it is not antagonistic to the American Automobile Association but that it will formulate its own rules, sanction its own meets and not call on the A. A. A. for assistance. Two paragraphs of its prospectus tell the empire in which it believes it will differ from the Contest Board of the A. A. A.

It will not try in any way to control either promoter, driver, mechanic or track by adopting arbitrary rules, and its operations will be limited to those who are given representation on its board, thereby eliminating taxation without representation.

It will be entirely a mutual organization with no salaried directors and only a paid secretary.



Regular Model Clero, hand-operated signal, which now sells for \$3.50

All sanctions will be issued for nominal sums, graded according to the size and class of tracks.

George W. Dickinson, of Detroit, is chairman of the board.

Saxon 30-Day Economy Run

The New York branch of the Saxon Motor Co. is to stage a 30-day endurance and economy test of a Saxon car, starting today. The route is laid out along the banks of the Hudson river, the trip up to Albany being made one day on one bank and the return trip being made the following day on the opposite bank. This will be repeated each day during the 30 days.

10 Per Cent to Speedwell Creditors

Provided the proposition for a settlement of the affairs of the Speedwell Motor Car Co., Dayton, O., by means of liquidation outside of the courts, is accepted by all the interests concerned, general merchandise creditors of the company may get 10 cents on the dollar on their claims. Receiver Green has been authorized by the court to borrow \$10,000 to repair certain parts of the factory and to properly guard it until it is again placed in operation. The merchandise claims against the company total about \$63,000.

CHANDLER BRINGS OUT A SEVEN-PASSENGER MODEL

Replaces Five-passenger Type—Lists at \$1,295—Roadster Body on Same Chassis at Same Figure

A new touring model for seven passengers has been announced by the Chandler Motor Car Co., Cleveland, replacing the former five-passenger touring car and, with a roadster built on the same chassis, forming the Chandler line. With either body the car sells for \$1,295.

The new body has been made of ample size to accommodate its quota of passengers, and to accommodate it the wheelbase has been increased from 120 to 122 inches. There are two folding seats which, when not in use, fit snugly into recesses at the back of the front seat and are covered by flaps; when opened they are self-supporting and firm and require no screws or other hand adjustments. There are no supports under them, which gives the maximum leg-room for the rear seat passengers.

Apart from the lengthening the chassis has undergone no change, the Chandler six-cylinder motor being used with L-head cylinders $3\frac{3}{4} \times 5$, cast in threes, Bosch magneto, Rayfield carbureter, Westinghouse starting-lighting, disk clutch, three-speed gearset, floating rear axle, left steer and center control, and 34×4 tires. The equipment, as in the past, is more than ordinarily complete.

Say Good-bye to Handley

INDIANAPOLIS, March 27—A testimonial banquet to J. I. Handley, president of the Mutual Motors Co. and the Marion Motor Co., held at the Columbia club, brought together about seventy-five of the most prominent men of the city to give Godspeed to the guest who is to leave the city to take up his work with the Mutual company in Jackson, Mich. Charles A. Bookwalter, ex-mayor of Indianapolis, acted as toastmaster and introduced Lieutenant Governor O'Neill.

In his parting words to the men who have stood by him during his ups and downs, Handley could not speak too highly of the bankers of the state who, he stated, did more for the motor car industry in Indianapolis than is generally believed. He said:

"The bankers lost money on the deals with many car concerns, but despite the losses, which were heavy in many instances, they cheered us up and asked us not to quit but to come back for more because they were back of us. When the Marion company lost about a quarter of a million dollars in the flood 2 years ago, the bankers stood by to see the company again on its feet."

MOTOR WORLD GUIDE

SPECIFICATIONS OF LEADING AMERICAN CARS BROUGHT UP TO DATE

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
ABBOTT-DETROIT												
K	4-4½x5½	27.2	Spidf	Zenith	A-Lite	Disk	3	116	34x4	1,785	.....	.....
L	4-4½x5½	32.4	Spidf	Zenith	A-Lite	Disk	3	121	38x4½	2,085	.....	2,085
F	6-3½x5½	33.75	Bosch	Zenith	A-Lite	Disk	4	130	35x4½	2,190	2,190	2,290
H	8-3 x5	28.8	Battery	Zenith	Remy	Disk	4	121	34x4	2,085	.....	.....
ALLEN												
34	4-3½x5	21.0	Wths	Stmbg	Wths	Cone	3	110	32x3½	895	895	.....
ALTER												
4-27	4-3½x4½	22.5	Remy	Holley	Remy	Disk	3	106	30x3½	685	685	.....
APPERSON												
4-40	4-4 x5	25.6	Elsmn	Rafid	Bljur	Band	3	116	34x4	1,350	.....	.....
4-45	4-4½x5	32.4	Elsmn	Rafid	Bljur	Band	3	120	36x4	1,685	1,685	.....
6-80	6-4½x5	43.5	Mea	Rafid	Bljur	Band	3	130	38x4	2,200	2,250	2,350
J-45	6-3½x5½	29.45	Elsmn	Rafid	Bljur	Band	3	122	34x4	1,485	.....	.....
ARBENZ												
1915	4-4½x5½	27.2	A. Kent	Shblr	Diehl	Cone	3	120	36x4	1,825	1,885	.....
ARGO												
Argo	4-2 5-16x4	8.5	A. Kent	Argo	.....	Cone	2	90	28x2½	285	.....	.....
AURBURN												
4-36	4-3½x5	22.5	.....	Rafid	.....	Cone	3	114	32x4	1,075	1,075	.....
6-40	6-3½x5	29.45	.....	Rafid	.....	Cone	3	126	34x4	1,550	.....	.....
6-47	6-3½x5½	33.75	Bosch	Rafid	.....	Cone	3	135	37x4½	2,000	.....	.....
AUSTIN												
66	6-4½x6	48.6	Wths	Master	Wths	Disk	6	141	31x4½	3,000	3,000	3,000
BAUER												
R	4-4½x5	36.1	Mea	Shblr	Emmn	Disk	3	110	34x3½	875	1,000	.....
BRISCOE												
B	4-3½x5½	15.6	Spidf	.....	Apico	Cone	3	107	30x3½	785	785	.....
BUICK												
C-24-5	4-3½x3½	22.5	Delco	Marvel	Delco	Cone	3	106	32x3½	900	950	.....
C-36-7	4-3½x5	22.5	Delco	Marvel	Delco	Cone	3	112	34x4	1,185	1,235	.....
C-54-5	6-3½x5	33.7	Delco	Marvel	Delco	Cone	3	130	38x4½	1,650	.....	1,650
CADILLAC												
51	8-3½x5½	31.2	Delco	Own	Delco	Disk	3	122	36x4½	1,975	1,975	1,975
CARTERCAR												
9	4-3½x5	19.6	Delco	Shblr	Delco	Frn Trs	106	33x4	.....	1,250	.....	.....
CASE												
35	4-4½x5½	29.0	Bosch	Rafid	Wths	Disk	3	120	35x4½	1,600	.....	.....
40	4-4½x5½	32.4	Bosch	Rafid	Wths	Disk	3	124	37x4½	1,800	2,000	.....
25	4-3½x4½	22.5	Wths	Stmbg	Wths	Disk	3	115½	34x4	1,250	.....	.....
CHADWICK												
19	6-5 x6	68.0	Bosch	Own	Wths	Band	4	119	37x5r	5,500	5,500	5,500
CHALMERS												
26-11	6-3½x5½	29.4	A. Kent	Rafid	Emmn	Disk	3	125½	34x4½	1,650	1,725	.....
M-6	6-4 x5½	38.4	Bosch	Rafid	Emmn	Disk	4	132	36x4½	2,400	2,400	.....
32	6-3½x5	23.5	A. Kent	Rafid	G & D	Disk	3	120	34x4	1,400	.....	.....
CHANDLER												
15	6-3½x5	27.3	Bosch	Rafid	G & D	Disk	3	120	34x4	1,295	.....	.....
CHEVROLET												
H-4	4-3 11-16x4	14.4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	.....	875	.....
H-2	4-3 11-16x4	14.4	Simms	Zenith	A-Lite	Cone	3	106	32x3½	750	.....	.....
COLE												
4-40	4-4½x5½	29.0	Delco	Stmbg	Delco	Cone	3	120	35x4½	1,485	1,485	1,485
6-50	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,865
6-51	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	126	35x4½	1,865	1,865	1,865
6-60	6-4½x5½	48.6	Delco	Stmbg	Delco	Cone	3	134	37x5	2,465	2,465	2,465
8	8-3½x4½	29.2	Delco	Stmbg	Delco	Cone	3	126	34x4½	1,785	.....	1,785
CRAWFORD												
6-35	6-3½x5	29.4	Wths	Stmbg	Wths	Disk	3	120	34x4	1,850	1,850	.....
CROW												
E-42	4-4 x5	25.6	G & D	Shblr	Emmn	Disk	3	114	32x4	1,150	1,165	.....
E-52	4-4½x5½	32.4	G & D	Shblr	Emmn	Disk	3	120	34x4	1,475	1,600	.....
F-62	6-3½x5½	33.7	G & D	Shblr	Emmn	Disk	3	130	36x4	1,895	1,895	.....
C. E. Jr	4-3½x4½	15.6	Disco	Holley	Disco	Disk	3	104	30x3½	725	.....	.....
CUNNINGHAM												
S	4-4½x5½	36.1	Bosch	Stmbg	Undec	Disk	3	129	37x5	.....	.....	3,750
CYCLEPLANE												
Tour	4-3½x4	10.0	A. Kent	Own	.....	Disk	3	108	28x3	350	.....	.....
Trav	2-3½x4	9.1	A. Kent	Shblr	.....	Disk	2	96	28x2½	250	.....	.....
DAVIS												
38-A	4-3½x5	22.5	Wths	Stmbg	Wths	Cone	3	112	34x4	1,235	1,235	.....
6-D	6-3½x5½	33.7	Bosch	Stmbg	G & D	Disk	4	128	37x4½	.....	2,185	.....
DETROITER												
C	4-3½x5	19.6	Remy	Stmbg	Remy	Disk	3	112	32x3½	.....	905	.....
8	8-3½x4½	24.2	.....	.....	.....	.....	.....	.....	.....	1,265	.....	.....
DILE												
A	4-3½x4	11.2	Brng	Holley	.....	Disk	3	96	28x3	495	.....	.....
DODGE												
...	4-3½x4½	24.2	Elsmn	Own	N E	Cone	3	110	32x3½	.....	785	.....

ABBREVIATIONS—"G & D" Gray & Davis, "Spidf" Spiltdorf, "A-Lite" Auto-Lite, "Wths" Westinghouse, "Shblr" Schbler "Elsmn" Elsmann, "Rafid" Rayfield, "A. Kent" A. Kent, "Emmn" Emerson, "Sern" Sevinson, "Undec" Undecided, "Brng" Barling, "Kngstn" Kingston, "Natl" National, "W. Land" Ward Leonard, "U. S. L." United States Lighting, "Conn" Connecticut, "Stwrt" Stewart, "Nwmb" Newcomb, "N E" North East.

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
DODGE												
LA-4	4-4½x5	30.6	Wths	Stmbg	Wths	Disk	3	121	36x4½	.....	2,200	2,240
DORT												
Four	4-3 x4	14.4	Conn	.....	Apico	Cone	3	100	30x3	495	.....	.....
Fire	4-3½x5	16.9	Conn	.....	Apico	Cone	3	100	30x3½	.....	680	.....
DRIGGS-SEABURY												
C	4-2½x4	10.0	Mgnto	Zephyr	.....	Cone	2	100	28x3	385	.....	.....
A	4-2½x4	10.0	Mgnto	Zephyr	.....	Frn Trs	100	28x2½	385	.....	.....	.....
EMPIRE												
31-40	4-3½x4½	22.5	Remy	Holley	Remy	Disk	3	108	32x3½	975	975	.....
ENGER												
6-50	6-3½x5	29.4	A. Kent	Rafid	G & D	Disk	3	125	34x4	1,485	.....	1,495
FIAT												
55	4-130x170	42.2	Bosch	Own	Wths	Disk	4	128	36x4½	4,650	4,650	4,650
6-50	6-110x150	44.0	Bosch	Own	Wths	Disk	4	135	37x5r	5,150	5,150	5,150
54	4-110x150	29.5	Bosch	Own	Wths	Disk	4	124	38x4½	4,150	4,150	4,150
FIRESTONE-COLUMBUS												
82-E	4-4½x5½	27.2	Spidf	Shblr	G & D	Cone	3	116	34x4	1,925	1,925	.....
90-E	6-4½x5½	40.8	Conn	Rafid	G & D	Disk	3	132	38x4	.....	2,500	2,650
FORD												
T	4-3½x4	22.5	Ford	Holley	.....	Disk	2	100	30x3	440	490	.....
FRANKLIN												
6-30	6-3½x4	31.5	Elsmn	Own	Dyneto	Disk	3	120	34x4½	2,150	2,150	.....
F. R. P.												
45-B	4-4 3-8x5½	33.8	Bosch	Stwrt	Bosch	Cone	4	110	36x4	All bodies to order		
GLIDE												
30	4-3½x5	19.6	Wths	Shblr	Wths	Disk	3	114	32x4	1,195	1,195	.....
GRANT												
M	4-2½x4	13.3	Swiss	Mayer	A-C	Cone	2	90	28x3	425	.....	.....
T	6-2½x4½	20.0	A. Kent	Mayer	A-C	Cone	3	106	30x3½	.....	795	.....
GREAT WESTERN												
A	4-4½x5½	29.0	Kngstn	Kngstn	G & D	Cone	3	117	36x4	1,710	1,710	.....
B	4-3½x5½	22.5	Kngstn	Kngstn	Bosch	Cone	3	117	34x4	2,200	.....	.....
HALLADAY												
6-40	6-	.....	Wths	Stmbg	Wths	Disk	3	100	34x4	.....	1,385	.....
HAYNES												
30	6-3½x5	29.4	Remy	Rafid	L-N	Disk	3	121	34x4	1,485	1,485	.....
31	6-4½x5½	43.5	Stmms	Remy	L-N	Band	3	130	36x4½	.....	2,250	.....
33	6-3½x5	29.4	Remy	Rafid	L-N	Disk	3	127	35x4½	.....	1,850	1,850
32	4-4½x5½	29.0	Stmms	Stmbg	L-N	Band	3	118	34x4	.....	1,060	.....
HERFF-BROOKS												
4-40	4-4½x4	32.4	Bosch	Stmbg	Apico	Cone	3	118	34x4	1,100	1,100	.....
6-50	6-4 x4½	38.4	Bosch	Stmbg	Apico	Cone	3	124	34x4	1,375	1,375	.....
HERRESHOFF												
4-16	4-2½x3½	8.9	A. Kent	Carter	Dyneto	Cone	3	94	28x3	590	.....	.....
HOLLIER												
...	8-3 x4½	28.8	.....	.....	.....	Cone	3	112	32x3½	.....	985	.....
HUDSON												
6-40	6-3½x5	29.4	Delco	Zenith	Delco	Disk	3	123½	34x4	1,550	.....	1,550
6-54	6-4½x5½	40.8	Delco	Zenith	Delco	Disk	4	135	36x4½	.....	2,350	.....
HUPMOBILE												
H	4-3½x5½	16.9	Bosch	Zenith	Wths	Disk	3	106	33x4	1,050	1,050	.....
K	4-3½x5½	18.2	A. Kent	Zenith	Wths	Disk	3	119	34x4	1,300	1,300	1,325
IMPERIAL												
64	4-3½x5	22.5	A. Kent	Stmbg	G & D	Disk	3	115	33x3½	.....	1,085	.....
56	6-3½x5½	33.7	Spidf	Stmbg	N E	Disk	3	130	36x4½	.....	2,200	.....
66	6-3 x5	21.6	.....	.....	.....	Disk	3	100	33x4	.....	1,285	.....
INTER-STATE												
T	4-3½x5	19.6	Remy	Shblr	Remy	Cone	3	110	33x4	.....	1,000	.....
JACKSON												
46	4-4½x5½	32.4	Remy	Shblr	A-Lite	Cone	3	117	34x4	1,375	1,375	.....
46-6	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3	125	34x4½	.....	1,950	.....
JEFFERY												
Four	4-4½x5½	22.5	Bosch	Rafid	U S L	Cone	4	116	34x4	1,500	1,500	.....
Six	6-3½x5½	33.7	Bosch	Rafid	U S L	Disk	4	133½	34x4½	.....	2,400	.....
Chfd	6-3 x5	21.6	Bosch	Stmbg	Bljur	Disk	4	122	34x4	1,650	1,650	.....
KEARNS												
L	4-2½x4	13.3	Bring	Zenith	A-C	Cone	3	109	28x3	450	.....	.....
KING												
...	4-3 15-16x5	24.7	A. Kent	Stmbg	W. Lndr	Disk	3	113	33x4	1,075	1,075	.....
...	8-2½x5	24.1	A. Kent	Zenith	W. Lndr	Disk	3	113	33x4	.....	1,350	.....
KISSEL												
4-36	4-4½x5½	29.0	Wths	Stmbg	Own	Cone	3	121	34x4	1,450	1,450	1,500
6-42	6-3½x5½	31.5	Wths	Stmbg	Kissel	Cone	3	129	34x4	1,650	1,650	1,650
6-48	6-4 x5½	38.4	Mea	Rafid	Kissel	Cone	4	139½	36x4½	2,350	2,350	2,350
6-60	6-4½x5½	48.6	Bosch	Rafid	Kissel	Cone	4	142	37x5	3,150	3,150	3,150
KLINE												
6-42	6-3½x5½	29.4	Wths	Rafid	Wths	Disk	3	123	34x4	1,750	1,750	.....
6-42-A	6-4½x5½	29.4	Wths	Rafid	Wths	Disk	3	127	36x4½	.....	1,850	.....

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
KRIT												
O	4-3½x4	22.5	Disco	Johnson	Disco	Disk	3 108	32x3½	850	850	....	....
M	4-3½x4	22.5	Hosch	Stmbg	N E	Disk	3 108	32x3½	965	965	....	....
LAMBERT												
48-C	4-3½x4	22.5	Briggs	Shblr	Briggs	Frn Trs	112	32x3½	....	1,200	....	....
68-C	4-4½x5½	27.2	Briggs	Shblr	Briggs	Frn Trs	117	34x3½	1,565	1,565	....	....
LENOX												
Four	4-4½x5½	29.0	Wths	Own	Wths	Cone	3 118	34x4½	....	2,000	....	....
Six	6-3½x5½	33.7	Wths	Own	Wths	Cone	3 130	34x4½	....	2,465	....	....
LEWIS												
VI	6-3½x6	29.4	Briggs	Stmbg	Remy	Disk	3 135	36x4	1,600	1,600	....	....
LEXINGTON												
Four	4-3½x5½	24.2	Wths	Shblr	Wths	Disk	3 115	34x4	1,375	1,375	....	....
6-L	6-3½x5	29.4	Wths	Shblr	Wths	Disk	3 128	34x4	1,875	1,875	....	....
6-M	6-4½x5	40.8	A. Kent	Stmbg	Jesco	Cone	3 130	36x4½	2,575	2,575	2,675	....
LOCOMOBILE												
M-5	6-4½x5½	48.6	Bosch	Own	Wths	Disk	4 140	37x5	5,100	....	5,100	....
R-5	6-4½x5	43.5	Bosch	Own	Wths	Disk	4 132	37x5r	4,400	4,400	....	....
LUVERNE												
700	6-4 x5	38.4	Bosch	Shblr	Jesco	Disk	3 128	36x4½	....	....	2,500	....
LYONS-KNIGHT												
K-4	4-4½x5½	32.4	Simms	Stmbg	N E	Disk	3 130	37x5	....	2,900	2,960	....
MARION												
...	8-3½x4½	31.2	Bosch	.....	G & D	Disk	3 115	34x4	1,500	1,500	....	....
...	6-3 x5	21.6	Bosch	.....	G & D	Disk	3 122	34x4	....	1,350	....	....
...	4-3½x5	22.5	Bosch	Rafid	G & D	Disk	3 115	34x4	....	1,250	....	....
MARMON												
41	6-4½x5½	43.5	Bosch	Stmbg	Bosch	Cone	3 132½	36x4½	3,250	3,250	3,350	....
48	6-4½x6	48.6	Bosch	Zenith	Roth	Disk	3 145	37x5r	....	....	5,000	....
MAXWELL												
25	4-3½x4½	21.0	Simms	Kingtn	Simms	Cone	3 103	30x3½	725	750	....	....
McFARLAN												
T	6-4 x6	38.4	Wths	Stmbg	Wths	Cone	3 132	36x4½	2,590	2,590	2,590	....
X	6-4½x6	48.6	Wths	Stmbg	Wths	Cone	3 132	36x4½	2,900	2,900	2,900	....
McINTYRE												
25	4-3½x5½	19.6	Bosch	Stmbg	G & D	Cone	3 106	32x3½	....	850	....	....
6-40	6-3½x4½	22.4	Briggs	Stmbg	Briggs	Disk	3 120	35x4	....	1,275	....	....
MERCER												
Spdstr	4-3½x6½	22.5	Bosch	Zenith	U S L	Disk	4 130	34x4½	2,750	....	....	....
...	4-3½x6½	22.5	Bosch	Zenith	U S L	Disk	4 130	34x4½	....	3,000	....	....
METEOR												
42	4-4 x5	25.6	A. Kent	Stmbg	Spdfr	Disk	3 114	34x4	....	1,075	....	....
45	6-3½x5	33.7	A. Kent	Stmbg	Spdfr	Disk	3 126	35x4	....	1,395	....	....
METZ												
22	4-3½x4	22.5	Bosch	A W T	G & D	Frn Trs	96	30x3	495	....	....	....
25	4-3½x4	24.2	Bosch	A W T	G & D	Frn Trs	108	32x3½	....	600	....	....
MITCHELL												
Four	4-4 x5½	25.6	Conn	Rafid	Spdfr	Cone	3 116	34x4	1,250	1,250	....	....
Six	6-4 x5½	38.4	Conn	Rafid	Spdfr	Cone	3 128	36x4	1,585	1,585	....	....
7-6	6-4½x7	43.5	Remy	Rafid	Remy	Cone	3 144	37x5	....	....	2,350	....
5-6	6-4½x6	43.5	Remy	Rafid	Remy	Cone	3 132	36x4½	1,895	1,895	....	....
MOLINE-KNIGHT												
...	4-4 x6	25.6	Bosch	Shblr	Wagner	Cone	4 128	36x4½	2,500	2,500	2,500	....
40	4-3½x5	19.6	Conn	.....	.....	Cone	3 118	34x4	....	1,475	....	....
MONARCH												
Six	6-3½x5	29.4	A. Kent	Zenith	W. Lnd	Cone	3 125	33x4	....	1,250	1,275	....
...	8-3 x5	28.8	.....	.....	W. Lnd	Cone	3 125	33x4	1,500	....	....	....
MONROE												
M-2	4-3 x3½	14.4	Conn	Zenith	A-Lite	Cone	3 96	30x3	460	....	....	....
MOON												
4-38	4-3½x5	22.5	Delco	Rafid	Delco	Disk	3 122	34x4	1,350	1,350	....	....
6-40	6-3½x5	29.4	Delco	Rafid	Delco	Disk	3 122	34x4	1,575	....	....	....
6-50	6-3½x5½	33.7	Delco	Rafid	Delco	Disk	4 130	35x4½	2,150	....	....	....
MORSE												
D	4-4½x5	34.2	Elsmn	Stmbg	G & D	Disk	4 127	36x4½	3,000	3,000	3,000	....
NATIONAL												
AB	6-3½x5½	33.7	Elsmn	Rafid	Wths	Cone	3 134	36x4½	2,375	2,375	....	....
NORWALK												
F	6-3½x5½	29.4	A. Kent	Rafid	G & D	Disk	4 131	37x4	1,675	....	....	....
OAKLAND												
37	4-3½x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,150	1,200	....	....
49	6-3½x5	29.4	Delco	Johnson	Delco	Cone	3 123½	35x4½	....	1,685	....	....
Spdstr	4-3½x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,100	....	....	....
OGREN												
Six	6-3½x5½	33.7	Bosch	Rafid	B-Rahm	.....	3	....	....	....	2,500	....
OLDSMOBILE												
42	4-3½x5	19.6	Delco	Marvel	Delco	Cone	3 112	33x4	1,285	1,285	....	....
55	6-4½x5½	43.5	Delco	Marvel	Delco	Cone	3 130	36x5	....	....	2,975	....
OVERLAND												
80	4-4½x4½	27.2	Bosch	Shblr	A-Lite	Cone	3 114	34x4	1,050	1,075	....	....
81	4-4 x4½	25.6	Spdfr	Shblr	A-Lite	Cone	3 106	33x4	795	850	....	....
82	6-3½x5½	29.4	Bosch	Shblr	A-Lite	Cone	3 125	35x4½	....	....	1,475	....
OWEN												
...	6-3½x5½	33.7	Owen	Master	O M	O M	3	136	36x5	3,750	....	3,750
PACKARD												
3-38	6-4 x5½	38.4	Bosch	Own	Bljur	Plate	3 140	37x5r	3,750	3,750	3,850	....
5-48	6-4½x5½	48.6	Bosch	Own	Bljur	Plate	3 144	37x5	4,750	4,750	4,850	....
PAIGE												
Six	6-3½x5½	29.4	Bosch	Rafid	G & D	Disk	3 124	34x4	1,385	....	1,395	....
36	4-4 x5	25.6	Bosch	Stwrt	G & D	Disk	3 116	34x4	1,075	1,075	....	....
PARTIN-PALMER												
20	4-3½x4	15.6	A. Kent	Muir	G & D	Disk	3 96	28x3	495	....	....	....
38	4-3½x5½	22.5	A. Kent	Stmbg	G & D	Done	3 115	33x4	1,075	....	....	....
PATERSON												
4-32	4-3½x5	19.6	Delco	Stmbg	Delco	Cone	3 112	33x4	....	1,695	....	....
6-48	6-3½x5	29.4	Delco	Stmbg	Delco	Cone	3 124	34x4	....	1,495	....	....
PATHFINDER												
...	6-3½x5½	33.7	Wths	Shblr	Wths	Disk	4 125	34x4½	2,225	....	2,325	....

Model	Motor	S. A. E. Rating	Ignition	Carburetor	Starter	Clutch	Gearset	Wheelbase	Tires	2-Passenger	5-Passenger	7-Passenger
PEERLESS												
54	4-3½x5	22.5	A. Kent	Stmbg	G & D	Disk	3 113	34x4	2,000	2,000	....	....
55	6-3½x5	29.4	A. Kent	Stmbg	G & D	Disk	3 121	34x4	2,250	2,250	....	....
48-6	6-4½x6	48.6	Bosch	Own	G & D	Band	4 137	37x5	4,900	....	5,000	....
PIERCE-ARROW												
C-3	6-4 x5½	38.4	Bosch	Own	Wths	Cone	4 134	36x4½	4,300	4,300	....	....
B-3	6-4½x5½	48.6	Bosch	Own	Wths	Cone	4 142	37x5	4,900	4,900	5,000	....
A-3	6-5 x7	60.0	Bosch	Own	Wths	Cone	4 147½	38x5½r	5,900	5,900	6,000	....
PILOT												
55	6-3½x5½	29.4	Wths	Shblr	Wths	Cone	3 126	34x4	1,885	1,885	1,985	....
75	6-4½x6	48.6	Wths	Carter	Wths	Cone	3 132	37x4½	2,885	2,885	2,885	....
PREMIER												
6-50	6-4 x5½	38.4	Elsmn	Rafid	Remy	Diak	3 132	36x4½	1,985	1,985	1,985	....
PRATT												
6-50	6-3½x5½	33.7	A. Kent	Rafid	G & D	Diak	4 132	37x4½	2,150	2,150	2,250	....
PULLMAN												
Jr	4-3½x4½	22.5	Spldf	Stmbg	Spldf	Diak	3 110	30x3½	740	740	....	....
6-48	6-3½x5½	33.7	Simms	Stmbg	Wths	Diak	4 134	36x4½	2,500	2,500	2,550	....
RAYFIELD												
20	4-2½x4½	12.0	A. Kent	Own	.....	Diak	3 96	28x3	....	365	....	....
R-C-H												
K	4-3½x5	16.9	Bosch	B-D	W. Lndr	Cone	3 110	32x3½	....	775	....	....
REGAL												
D	4-3½x5	22.5	A. Kent	Stwrt	Bosch	Cone	3 112	33x4	1,085	1,085	....	....
...	8-2½x4½	26.6	.....	Stwrt	B-Rahm	.....	112	33x4	1,250	1,250	....	....
...	4-3½x3½	18.2	.....	.....	Spldf	.....	3 106	30x3½	650	650	....	....
REMINGTON												
...	4-3½x4	15.6	A. Kent	.....	W. Lndr	Cone	3 105	30x3½	685	685	....	....
Glnd	8-3½x4½	31.2	A. Kent	Zenith	G & D	Diak	3 116	35x4½	1,485	....	....	....
REPUBLIC												
E	6-4½x5	43.5	Delco	Rafid	Delco	Cone	4 133	36x4½	....	2,950	3,000	....
REO												
M	6-3 9-16x5½	30.4	Remy	Johnn	Remy	Diak	3 122	34x4	....	1,385	....	....
ST	4-4½x4½	27.2	Natnl	Holley	Natnl	Diak	3 112	34x4	1,000	....	....	....
R	4-4½x4½	27.2	Remy	Holley	Remy	Diak	3 115	34x4	....	1,050	....	....
ROSS												
A	8-3 x4½	28.8	.....	.....	Own	Diak	3 115	34x4	....	1,350	....	....
SAXON												
A	4-2½x4	11.2	A. Kent	Mayer	.....	Plate	2 96	28x3	365	....	....	....
B2	6-2½x4½	20.0	A. Kent	Mayer	G & D	Diak	3 112	32x3½	....	785	....	....
SCRIPPS-BOOTH												
C	4-2½x4	13.3	A. Kent	Zenith	Bljur	Diak	3 110	30x3½	775	....	....	....
SPAULDING												
H	4-4½x5½	29.0	Simms	Rafid	Entz	Cone	3 120	36x4	....	1,680	....	....
S. G. V.												
J	4-3½x4½	24.2	Bosch	Zenith	W. Lndr	Diak	4 118	34x4	3,300	3,300	....	....
SIMPLEX												
38	4-4½x6½	38.2	Bosch	Nwcm	Bosch	Diak	4 137	37x5r	All bodies	to order	....	....
50	4-5½x6½	46.3	Bosch	Nwcm	Bosch	Diak	4 137	37x5r	All bodies	to order	....	....
SINGER												
51x	6-4 x5½	38.4	Elsmn	C R G	Wths	Diak	4 135	36x4½	2,350	2,350	....	....
SPEEDWELL												
I	6-4½x5½	40.8	Wths	Shblr	Wths	Diak	3 135	37x5	....	....	2,930	....
SPHINX												
A-15	4-3½x5	16.9	Spldf	Mayer	Spldf	Cone	3 112	30x3½	....	695	....	....
STEARNES												
L-4	4-3½x5½	22.5	Bosch	Shblr	G & D	Cone	3 119	34x4	1,750	1,750	....	....
8-K-4	4-4½x5½	26.0	Bosch	Stmbg	G & D	Diak	3 127	36x4½	3,750	3,750	3,900	....
8-K-6	4-6½x5½	43.5	Bosch	Stmbg	G & D	Diak	4 134	37x5	4,850	4,850	5,000	....
STUDEBAKER												
4-SD	4-3½x5	19.6	Remy	Shblr	Wagner	Cone	3 108	33x4	985	985	....	....
6-E-C	6-3½x5	29.4	Remy	Shblr	Wagner	Cone	3 121	34x4	....	1,385	1,450	....
STUTZ												
H.C.8	4-3½x5	22.5	Remy	Stmbg	Remy	Cone	3 108	32x4	1,475	....	....	....
Br. Cat	4-4½x5½	36.1	Bosch	Stmbg	Remy	Cone	3 120	34x4½	2,000	....	....	....
51x	6-4 x5	38.4	Elsmn	Stmbg	Remy	Cone	3 130	34x4½	2,125	....	....	....
T. Car	4-4½x5½	36.1	Bosch	Stmbg	Remy	Cone	3 130	34x4½	....	2,275	....	....
T. Car	6-4 x5	38.4	Elsmn	Stmbg	Remy	Cone	3 130	34x4½	....	2,400	....	....
TOURNAINE												
12	6-4 x5½	38.4	Simms	Zenith	Wths	Diak	4 124	34x4½	3,150	3,150	3,250	....
TRUMBULL												
15-AB	4-2½x4	13.3	Spldf	Breeze	W. Lndr	Cone	3 80	28x3	365	....	....	....
TWOMBLY												
...	4-3½x4	15.6	Spldf	Zephyr	Undec	Cone	3 100	30x3	669	730	....	....
VELIE												
4-45	4-4½x5½	34.2	Bosch	Stmbg	G & D	Diak	4 121	37x4½	1,750	1,750	....	....
6-50	6-3½x5½	33.7	Bosch	Stmbg	G & D	Diak	4 126	37x4½	2,015	2,015	....	....
Blwrl	6-3½x5	29.4	A. Kent	Stmbg	G & D	Diak	4 124	34x4	1,595	1,595	....	....
VIXEN												
S.B	4-2½x4	12.0	A. Kent	Zephyr	.....	.....	106	28x3	365	....	....	....
VULCAN												
...	4-3½x5½	19.6	Wths	Stmbg	Wths	Diak	3 120	32x3½	975	975	....	....
WESTCOTT												
O	4-3½x5	19.6	Delco	Shblr	Delco	Cone	3 113	33x4	1,185	1,185	....	....
U	6-2½x5	29.4	Delco	Rafid	Delco	Cone	3 125	34x4	....	1,585	....	....
WHITE												
30	4-3½x5½	22.5	Bosch	Own	Own	Plate	4 115	32x4	2,650	2,700	....	....
45	4-4½x6½	29.0	Bosch	Own	Own	Plate	4 132½	36x4½	....	....	3,800	....
60	6-4½x5½	43.5	Bosch	Own	Own	Plate	4 140½	37x5	All bodies	to order	....	....
WILLYS-KNIGHT												
K-19	4-4 x5½	25.6	Simms	Zenith	U S L	Cone	4 120	36x4½	....	2,475	....	....
WINTON												
21	6-4½x5½	48.6	Bosch	Rafid	Airor Elec	Diak	4 136	37x5	3,250	3,250	3,500	....
21A	6-3½x5½	31.5	Bosch	Rafid	Bljur	Diak	4 128	36x4½	2,285	2,285	....	....
WOODS MOBILETTE												
3	4-2½x4	10.0	Mgnto	Mayer	.....	Cone	2 104	28x2½	380	....	....	....

Motor Car Dealers Recently Established

PLEASURE CARS

CALIFORNIA

Place	Car	Dealer
El Centro	King	H. B. Gillespie
Fullerton	King	O. M. Skinner
Hollywood	King	C. F. Little
Lordsburg	Lexington	L. D. Larimer
Modesto	Oldsmobile	M. A. McLean
Ontario	King	W. L. Ross
Oxnard	Kissel	J. L. Milligan
Redondo	King	J. H. Covanaugh
Riverside	King	A. B. Gilbert
San Bernardino	Lexington	Ben Buxton
San Fernando	King	J. R. Irtle
San Pedro	Lexington	Pacific Garage
Santa Ana	King	H. H. Kelly
Santa Barbara	King	California Motor Car Co.
Ventura	Lexington	J. C. Judd

CANADA

St. Catharines	Oldsmobile	International Garage
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COLORADO

Ponder	Oldsmobile	Wolcott & Blake
Colorado Springs	Oldsmobile	Markheffel Motor Co.
Durango	Buick	Wm. Phelan
Fort Morgan	Oldsmobile	Wittwer & Wittwer
Glenwood Springs	Oldsmobile	G. A. Hopkins
Pueblo	Oldsmobile	Pueblo Automobile Co.
Salida	Oldsmobile	Salida Auto Co.
Walsenburg	Oldsmobile	Unfug & Unfug

IDAHO

Gooding	Oldsmobile	C. C. Smith
Pocatello	Oldsmobile	J. Munger
Rigby	Oldsmobile	J. Woodmansee

ILLINOIS

Belvidere	Kissel	D. P. Greenlee
Dixon	Kissel	McKenney & Nelson
Harbin	King	E. E. Williams

INDIANA

Indianapolis	Metz	Whitaker-Keely Sales Co.
Indianapolis	Mitchell	C. C. Hines

IOWA

Hull	Kissel	Spencer Investment Co.
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MARYLAND

Baltimore	Hupmobile	Morton & Loose
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MASSACHUSETTS

Greenfield	Oldsmobile	M. Barber
Fall River	Oldsmobile	Pocassett Garage & Mch. Co.

MICHIGAN

Bessemer	Oldsmobile	P. E. Graham
Lansing	Franklin	E. W. Goodnow

MISSOURI

Jefferson City	Haynes	Baker Tire Co.
Hannibal	Haynes	Hannibal Wagon Co.
Tipton	Metz	Mansfield & Dick
La Belle	Oldsmobile	W. E. Ross

MONTANA

Butte	Oldsmobile	Holm & Craven
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NEBRASKA

Albion	Haynes	J. H. Moore
Alliance	Haynes	H. J. Ellis
Ashland	Metz	W. A. Fowler
Bancroft	Metz	J. H. Munderson
Benedict	Metz	T. E. Tighe
Bartley	Grant	L. A. Russell
Callaway	Metz	H. Ridder
David City	Grant	E. D. Cuckler
Fremont	Grant	Zapp Auto Co.
Grand Island	Grant	J. P. Dugan
Hastings	Grant	Stephen Schultz
Hastings	Haynes	W. J. Swanson
Holdrege	Grant	Lyle & H. Young
Humphrey	Grant	H. J. Breunig
Lincoln	Grant	P. W. Rathbun
Louisville	Carter	A. R. Standish
Merna	Carter	C. Hipsley
Norfolk	Auburn	Paswalk Co.
Norfolk	Metz	Wilson Bull Tractor Co.
Omaha	Moline-Knight	Moline Automobile Co.
Ord	Grant	F. Beran
Oscarola	Grant	C. E. Hansen
Paxton	Carter	F. L. Burt
Plymouth	Metz	A. W. Welch
Polk	Grant	R. H. Thesing
Prague	Grant	J. Pabian
Ravenna	Grant	R. Harrington
Rulo	Metz	F. Winterbottom
Scottsbluff	Oldsmobile	C. R. Edwards
Seward	Metz	H. A. Hershberger
Stamford	Grant	D. Elder
Stanton	Grant	G. Lind
Stanton	Moline-Knight	J. B. Stucker
Swedeberg	Grant	A. J. Olson
Trenton	Grant	A. H. French

NEW HAMPSHIRE

Dover	Pullman	G. O. Athorne
Newport	Dort	Kidder Garage Co.

NEW JERSEY

Bridgeton	Oldsmobile	J. R. Elwell
West Creek	Kissel	R. S. Cox

NEW MEXICO

Place	Car	Dealer
Albuquerque	Oldsmobile	J. L. LaDriere
Las Vegas	Oldsmobile	Midland Garage
Raton	Buick	A. R. Davis
Santa Fe	Oldsmobile	Auto Trouble Shop
Taos	Oldsmobile	T. P. Martin

NEW YORK

Avon	Kissel	H. E. Longfellow
Far Rockaway	Dort	J. M. J. Garage, Inc.
Manchester	Stutz	E. Reed
Olean	Dort	Mazza & Questa
Olean	Kissel	Lester & Thomas
Rochester	Moline-Knight	C. H. Washburne

NORTH DAKOTA

Cando	Franklin	Bonawitz & Tallman
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OHIO

Ashland	Buick	Topping's Fireproof Garage
Powerstown	Buick	W. B. Penn Co.
Cenfield	Buick	C. S. Dodd
Cincinnati	Kissel	Herold Auto Co.
Cleveland	Chevrolet	Hamilton Motor Car Co.
Cleveland	Chevrolet	Hamilton Motor Car Co.
Cleveland	Carter	Carter Sales Co.
Cleveland	Pierce-Arrow	Weaver-Brownlee
Cleveland	Kissel	Elsmann Auto Co.
Clyde	Kissel	W. A. Roush & Son
Columbus	Chevrolet	Winders Motor Sales Co.
Coshocton	Haynes	Fifth St. Garage
Crooksville	King	Crooksville Garage
Cygnut	Oakland	C. E. Grant
Dayton	Kissel	Miami Motor Co.
Danville	Buick	C. T. Metz
Delaware	Ford	J. J. Neville
Delaware	Buick	J. J. Neville
Eaton	Chevrolet	S. Brower
Franzburg	Buick	A. T. Wood
Garrettsville	Buick	E. S. Fisher
Hamilton	Kissel	West Side Auto Co.
Hilliar's	Hiscoe	L. Doby
Huron	Dort	G. E. Rhinemiller
La Grange	Oldsmobile	E. L. Adams & J. A. Nichols
Lancaster	King	Star Motor Car Co.
Lodi	Buick	Sanford & Hahn

Recent Losses by Fire

Eric, Pa.—J. H. Berkenkamp Co.'s garage; building and three cars damaged; estimated loss \$5,500.

Literature Received

The Care and Repair of Tires is being distributed by the Firestone Tire & Rubber Co.



* Indicates sanctioned by A. A. A.

April 4, Los Angeles, Cal.—Track meet.

April 20-22, Oklahoma City, Okla.—Road race, S. W. Auto Racing Assn.*

April 30-May 1 and 2, Portland, Ore.—Track meet.

May 8, Salem, Ore.—Track meet.

May 15-16, Vancouver, Wash.—Track meet.

May 17-18, Boston, Mass.—American Automobile Association annual meeting.

May 23, Centralia, Wash.—Track meet, Centralia-Chehalis.

May 29, Indianapolis, Ind.—500-mile race, Indianapolis Motor Speedway.*

May 29-30, Seattle, Wash.—Track meet.

June 9, Galesburg, Ill.—Galesburg District Fair Association's 200-mile race.

June 19, Chicago, Ill.—Speedway, 500-mile race, Speedway Park Assn.*

June 25, Sioux City, Ia.—Track meet.

July 3, Sioux City, Ia.—Speedway, 300-mile race, Speedway Assn.*

July 4, Oshkosh, Wis.—Track meet.

July 4, Visalia, Cal.—Road race.

Akron. It is a 48-page booklet in 8 chapters, each one devoted to some phase of tire upkeep or deterioration. The booklet contains much of value to the man who uses tires and is largely free from any advertising element; not only is the tire user told what happens under certain conditions, but why it happens; and he is told how to avoid troubles. The booklet contains 33 black-background illustrations of damaged tires and tubes with explanations as to what caused the damage. The text is in black on a brown tint, with hand-lettered chapter titles.

Motor Car Securities Quotations

	March 27, 1914	March 27, 1915
	Askd	Bld
Ajax-Grieb Rubber Co., com.	200	285
Ajax-Grieb Rubber Co., pfd.	98	100
Aluminum Castings, pfd.	98	100
Chalmers Motor Co., com.	78	81
Chalmers Motor Co., pfd.	92	90
Chalmers Tire & Rubber Co., com.	292	388
Firestone Tire & Rubber Co., pfd.	108	110
General Motors Co., com.	77	113
General Motors Co., pfd.	93	98
B. F. Goodrich Co., com.	22	33
B. F. Goodrich Co., pfd.	88	97
Goodyear Tire & Rubber Co., com.	175	180
Goodyear Tire & Rubber Co., pfd.	94	103
Gray & Davis, Inc., pfd.	90	97
International Motor Co., com.	7	7
International Motor Co., pfd.	15	20
Kelly-Springfield Tire Co., com.	117	118
Kelly-Springfield Tire Co., 1st pfd.	81	83
Kelly-Springfield Tire Co., 2nd pfd.	124	128
Maxwell Motor Co., 1st pfd.	71	73
Maxwell Motor Co., 2nd pfd.	113	125
Miller Rubber Co., com.	165	170
Miller Rubber Co., pfd.	101	103
Packard Motor Car Co., com.	161	160
Packard Motor Car Co., pfd.	95	93
Peerless Motor Car Co., com.	20	21
Peerless Motor Car Co., pfd.	80	85
Pope Mfg. Co., com.	12	16
Pope Mfg. Co., pfd.	16	16
Portage Rubber Co., com.	30	34
Portage Rubber Co., pfd.	85	85
Reo Motor Truck Co., com.	84	112
Reo Motor Truck Co., pfd.	184	224
Stewart-Warner Speed Corp., com.	112	124
Stewart-Warner Speed Corp., pfd.	100	102
Studebaker Corp., com.	30	48
Studebaker Corp., pfd.	85	86
Swinehart Tire & Rubber Co., com.	60	74
U. S. Rubber Co., com.	61	62
U. S. Rubber Co., pfd.	103	104
White Co., pfd.	107	110
Willis-Overland Co., com.	64	66
Willis-Overland Co., pfd.	89	94

* Ex-dividend

* Par value \$10; all others \$100

July 4, Tacoma, Wash.—Speedway races, Speedway Assn.*

July 5, Omaha, Neb.—Speedway races, Omaha Motor Speedway.*

July 9, Burlington, Ia.—100-mile track race, Tri-State Fair Assn.

July 31, Denver, Col.—Road race. Promoter, Chas. L. Newcomb, Jr.

Aug. 2-3, San Francisco, Cal.—Tri-State Good Roads Association, third annual convention.

Aug. 14, Janesville, Wis.—Track meet, Janesville Park Assn.

Aug. 20-21, Elgin, Ill.—Road races, Chicago Auto Club.

Sept. 6, Detroit, Mich.—Speedway races, Detroit Speedway Club.

Sept. 6, Providence, R. I.—Speedway races, Promoter, F. E. Perkins.

Sept. 8, Kalamazoo, Mich.—100-mile track race, Kalamazoo Motor Speedway.

Sept. 20-25, San Francisco, Cal.—International Engineering Congress.

Oct. 1-2, Trenton, N. J.—Track meet, Inter-State Fair.

THE SHOW CIRCUIT

Mar. 30-April 2, Johnstown, Pa.—Show; Auditorium.

Apr. 5-10, Du Bois, Pa.—Show; Moose Hall.

Apr. 12-17, Paterson, N. J.—Show; Auditorium; Robert A. Mitchell, director.

Champion

"Toledo Made for the Whole World's Trade"



**CHAMPION
TWO-PIECE
HEAVY STONE**
all sizes
Price \$1.25
For High Powered
Automobiles,
Trucks and
Stationary Engines



**CHAMPION
X**
Special
1/2 inch
Price 75c
Factory Equip-
ment on FORD
cars since 1911

Did You Get Your 1915 Profit Sharing Agreement?

Have you filled it in, signed it, and given it to your jobber or his salesman?

REMEMBER:—Our Profit Sharing Agreement entitles you to share our profits, a share payable to you at the end of the year, by **check, direct from us.** A profit based on the amount of business you do on Champion plugs.

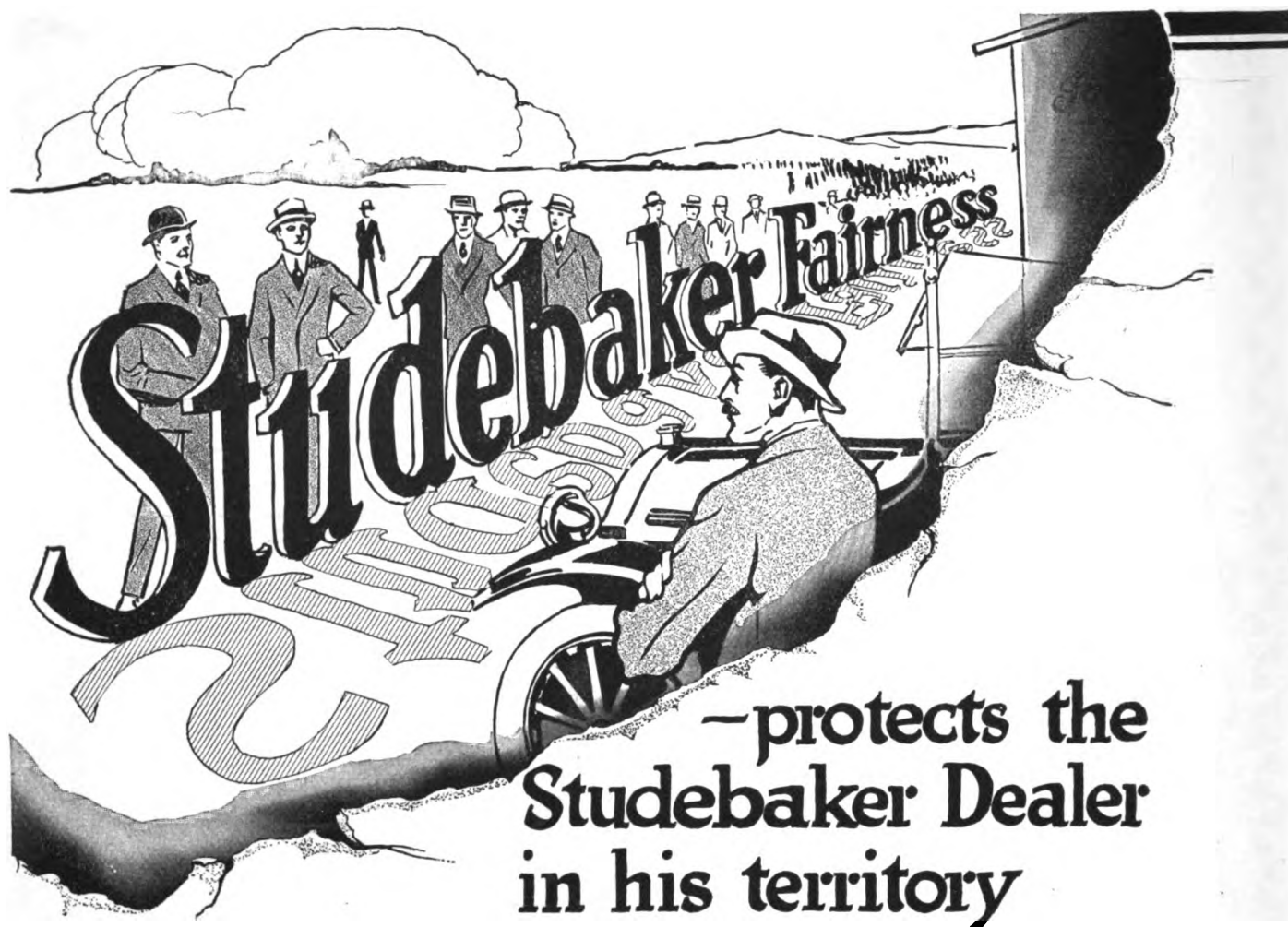
You have everything to gain and nothing to lose. If extra profits on the quality spark plug—extra profits on the most widely advertised spark plug—extra profits on the easiest selling and most called for spark plug—appeal to you, fill out the agreement at once, and give it to your jobber's salesman.

Our world wide NATIONAL ADVERTISING CAMPAIGN begins in April. Every car owner in your territory will know even more about Champion Spark Plugs. Large space will be taken in the Saturday Evening Post, Digest, Christian Herald, Popular Mechanics, and the leading Farm and Daily Newspapers in your territory. This campaign is for your benefit. Cash in on this publicity. See that your stock of "Champions" is complete.

CHAMPION SPARK PLUG CO.

1802 Upton Avenue

Toledo, Ohio



—protects the Studebaker Dealer in his territory

You see, Studebaker looks upon the man who is accepted as a Studebaker DEALER as a MEMBER of the Studebaker Family who has come to STAY.

He's accepted—because he's the type of man that Studebaker wants in its selling organization—a progressive, energetic, up-to-the-minute business man. He's given all the assistance of the entire Studebaker organization.

And he knows that if by reason of ill-luck or some other mishap he has a season that isn't up to the mark, Studebaker is going to protect him in his territory and give him all the help that Studebaker can give to make his agency a success. And when you consider the size of the organization and the quality of the car itself, you can readily appreciate why so many dealers seek the Studebaker agency

— because it's a

Studebaker

Studebaker ROADSTER, \$ 985
Studebaker FOUR - - - 985
Studebaker LIGHT SIX - 1385
Studebaker SIX, 7-passenger, 1450
Studebaker Delivery Car, 1085

All Prices F. O. B. Detroit

Every business man who is selling cars, Studebaker or any other make, will enjoy reading a book which we have recently issued, entitled

"How to Make Money Selling Motor Cars"

It is not a book on selling Studebaker cars—but a study of the BUSINESS of selling cars from a business viewpoint. And it embodies the actual experience of men who have spent years in the field, and who know the problems you face. Their ideas as to the solution of those problems will interest you. Write for the book, it is free.

STUDEBAKER — — — DETROIT



IF every motorist could see the real “workings” of his storage battery he might give it a little more thought.

He'd soon find that a tremendous amount of energy is being piled up under that box, so that he can sit in the front seat, push a button and hear his motor spin.

Then he'd probably appreciate why *even a Willard Battery* needs good pure water and ordinary care. Nothing is so good that it won't wear out, but Willard construction and expert Willard Service Stations help to give these batteries the longest possible life.

Long life and efficiency—the combined reason for 85 % of American makers of electrically equipped motor cars specifying Willard.

Willard Storage Battery Company Cleveland, Ohio

New York Branch: 228-230 W. 58th St.
Chicago Branch: 2524-30 S. Wabash Ave.

Detroit Branch: 736-38-40 Woodward Ave.
San Francisco Branch: 821 Monadnock Bldg.

Indianapolis Branch: 318 North Illinois St.

Service Stations in All Principal Cities in the United States, Canada and Mexico

AT NEW
LOW
PRICES

WITH
FISK
SERVICE

THE **FISK** NON-SKID

Strike While The Iron Is HOT!

FROM all parts of the country come orders for and glowing reports of Fisk Tires.

Your customers are in a receptive frame of mind. For months we have been hammering away with advertising telling the truth about our products. We have woven around Fisk Tires a quality that few car owners can resist.

And now, as a climax, come **Fisk New Low Prices** for **Fisk Established Quality**—just the impetus needed to put over many a sale.

The Fisk Non-Skid Now Costs Less Than Many Smooth Tread Tires

Wise motorists will buy nothing but Fisk Non-Skids from now on. Because of our wonderful factory organization and greatly strengthened distribution the price has been materially reduced, at the same time maintaining our high quality. *You*, as a Dealer, can surely see what this means in a sales way.

There is no salesman as persuasive as the satisfied user. Enthusiastic customers and steady profits go hand in hand. There is a lot of Fisk Tire business waiting for up-to-date dealers everywhere. This is your opportunity. Act quickly. Write for our proposition now to Dept. 23.



THE FISK RUBBER COMPANY

Factory and Home Office

Chicopee Falls, Mass.

Fisk Branches in All Principal Cities

AT NEW
LOW
PRICES

WITH
FISK
SERVICE

When writing advertisers please mention Motor World



"These Standards are the Keystones of Efficiency"

The Standard "Eight" and Standard "Six" Are Ready for Delivery

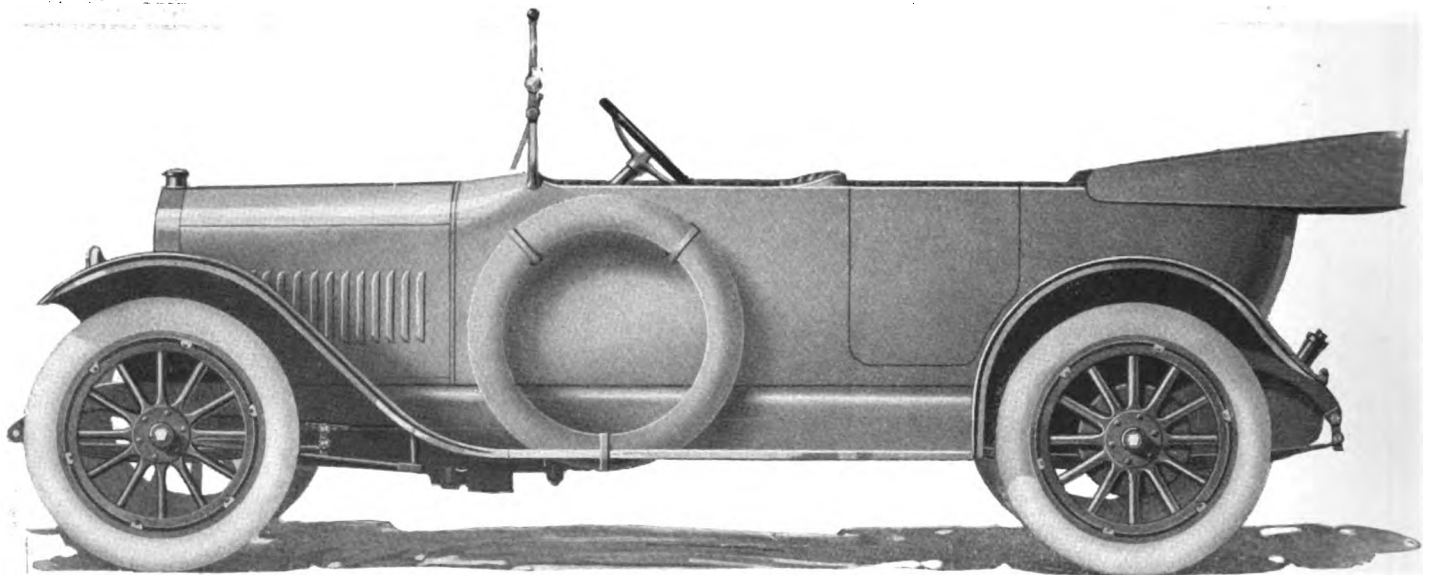
Nearly three years have passed since our engineers and designers were told to "go ahead" with their plans for Standard Automobiles.

For over two years Standard Cars have been on the roads—the worst roads in the country. During this time these cars have been driven by Standard men over the mountain roads of Pennsylvania, winter and summer, in all kinds of weather.

These men have found that Standard Automobiles are every bit as worthy the name Standard as our other products—products known wherever transportation moves on wheels.

Standard "Eights" have surpassed the requirements of their builders. Vibration is almost imperceptible. The flexibility of the motor is even greater than was demanded. Without a change of gears, the Standard "Eight" fairly floats up grades—without a quiver of hesitation—grades that would stall the average car that attempted a similar feat. The motor's response is instant. In five seconds it develops a fifty mile headway. Perfect in theory, the "Eight" as produced in the Standard is near perfection in practice.

Standard "Sixes" are not simply cars of approved design. They illustrate the advanced practice that characterizes Standard products. Larger and more powerful than the "Eights," they are especially designed for those desiring a car of supreme refinement and maximum efficiency at a fair price.



The Standard "Eight"

\$1735

SPECIFICATIONS

MOTOR—8 cylinder; "V" shape; bore 3 inches, stroke 5 inches; unit power plant, combining motor, clutch and transmission in one housing on 3 point support.

CYLINDERS—L-head; cast 4 enbloc; valve seats and valve stem guides water jacketed; cylinders staggered so that each connecting rod has individual bearing on crank shaft, working side by side; cylinders of best grade gray iron having inlet pipes cast in the cylinder and having separate exhaust pipes bolted on.

CONNECTING RODS—Drop forged steel, I-beam section, finished on all sides, insuring perfect alignment and balance.

INLET AND EXHAUST VALVES—Nickel steel; mitre seats; valve springs and tappets enclosed.

CRANK SHAFT—1 piece drop forging of special crank shaft steel, perfectly balanced; ground all over and mounted on three babbit bearings.

CAM SHAFT—Single shaft having 16 integral cams, one for each valve.

TIMING GEARS—Operate in oil direct from force feed pump.

FUEL TANK—On rear; 20 gallon capacity; vacuum feed system; contents indicator on tank.

IGNITION—Storage battery.

WATER PUMP—Centrifugal.

LUBRICATION—Is by pressure feed to crank pins through hollow crank shaft and to all other journal bearings by means of safety valve control, discharging the excess pressure on to the spiral gears in front, which drive the cam shaft.

CONTROL—Hand levers for throttle and spark on stationary sector above steering wheel; accelerator on foot board.

LIGHTING SYSTEM—Generator located on front of motor and storage battery under front seat furnishing current for head lights, dash lights, rear light and starting motor.

STARTER—Is located on rear right side of motor engaging with a hardened steel ring gear on the fly wheel, and is operated by means of a push button connecting with automatic screw pinion starting device.

CLUTCH—Multiple disc; Raybestos face; steel plate; smooth in action.

TRANSMISSION—3 speeds forward and reverse.

RADIATOR—Honey comb; water circulation.

FAN—Pressed steel.

STEERING GEAR—Irreversible worm type located on left side of car with center control; 18-inch corrugated walnut steering wheel; drag link ball jointed with spring cushion; leather boots on all joints.

FRAME—Cold pressed steel, new wedge shape.

SPRINGS—Semi-elliptic front and rear; rear springs 2½ inches wide, front springs 2¼ inches wide.

FRONT AXLE—I-beam drop forging, special axle steel, heat treated.

REAR AXLE—Full floating with pressed steel housing.

WHEELS—Artillery type.

RIMS—Demountable.

TIRES—35 inches x 4½ inches.

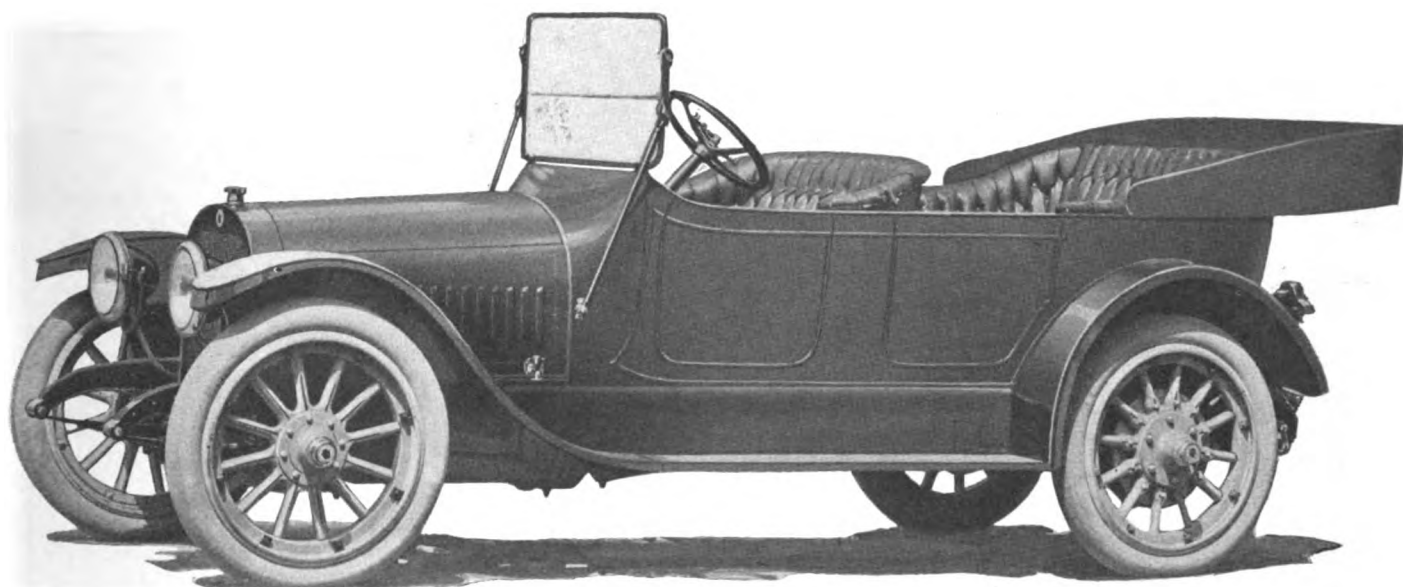
BRAKES—Service brake external contracting, operated by foot pedal; emergency brake internal expansion operated by hand lever.

WHEEL BASE—121 inches.

TREAD—56 inches.

BODY—7 passenger with ample room for oil; stream line design, extra large doors, deep upholstery of first-class material; electric wiring run through metal tubing to insure perfect insulation.

EQUIPMENT—Foot rail, coat rail, speedometer, motor driven electric horn, electric head lights, electric tail lamp, license carrier, rain vision, clear vision ventilating windshield, one man top with Jiffy curtains, tire carrier, jack and repair kit.



The Standard "Six"

\$2100

SPECIFICATIONS

MOTOR—"Unit Power Plant," combining motor, clutch and transmission in one housing, supported on 3 points. Bore 4 inches; stroke, 5½ inches.

CYLINDERS—Six, T-head, cast three enbloc. Valve seats and valve stem guides water jacketed.

PISTONS—Patented cross-head type, cast of a special metal. Each piston is of equal weight, insuring perfect balance.

WRIST-PINS—Hollow, nickel steel, accurately ground and held stationary in connecting rod. Bearings in piston.

CONNECTING RODS—Drop-forged steel, I-beam section, finished on all sides, insuring perfect alignment and balance. Each rod is of equal size and weight. Oil scoop on connecting rod caps.

INLET AND EXHAUST VALVES—Nickel-steel; inlet on left side; exhaust on right side of cylinders; mitre seats. Valve springs and tappets enclosed.

CRANK SHAFT—One-piece drop forging of special crank shaft steel, perfectly balanced; ground all over and mounted on three babbitt bearings.

CAM SHAFT—Cams forged integral with shaft, which is mounted on three bearings. Shaft enclosed in crank case and lubricated by splash.

VALVE GEARS—Cam and magneto shafts are driven by helical design gears, operating in a bath of heavy oil.

CARBURETOR—Single jet, float feed, water jacketed.

FUEL TANK—In rear, pressure feed, capacity 22 gallons; recording gauge and shut-off handle on tank.

IGNITION—Magneto and battery.

WATER PUMP—Bronze, centrifugal, operated by helical gear.

LUBRICATION—Pump circulating and splash system.

CONTROL—Hand levers for throttle and spark on stationary sector above steering wheel; accelerator on footboard.

LIGHTING SYSTEM—Lighting generator located on forward right side of motor and storage battery located under front seat, furnishing current for headlights, rear light and starting motor.

STARTING MOTOR—Starter is located on rear right side of motor, engaging with a hardened steel ring gear on the fly-wheel by means of an automatic screw pinion starting device operated by a push button.

CLUTCH—Multiple disc, Raybestos faced steel plate; self adjusting and smooth in action.

TRANSMISSION—Three speeds forward and reverse, mounted on imported ball bearings and run in a bath of heavy oil. Center control mounted over transmission case.

RADIATOR—Reinforced honeycomb radiator, water circulation; capacity 6½ gallons.

FAN—Pressed steel fan rotating on ball bearings, adjustable, silent belt drive.

STEERING GEAR—Irreversible worm gear type, located on left side of car. Drag link ball-jointed with spring cushions. Leather boots on all joints. 18-inch corrugated walnut steering wheel.

FRAME—Cold pressed steel, new wedge shaped 5-inch section, 3/16-inch stock.

SPRINGS—Front, half elliptic, 40 x 2¼ inches. Rear, three-quarter scroll elliptic, 53½ x 2¼. Rear springs underslung.

FRONT AXLE—I-beam forging, special axle steel, heat treated.

REAR AXLE—Full floating type with torque tube. Unit housing carries entire load. Rear hub clutch forged integral with drive shaft.

WHEELS—Artillery type. Front wheels, ball-bearing cup and cone type. Rear wheels mounted on double row annular ball bearings.

RIMS—Firestone quick detachable, demountable rims.

TIRES—Of standard make, 36 x 4½ inches.

BRAKES—Service brake external contracting, operated by foot pedal. Emergency brake internal expanding, operated by hand lever.

WHEELBASE—126 inches. Tread, 56 inches.

BODY—Body is sheet steel, of new and up-to-date streamline design, having extra large doors, wide moulding or band running from rear doors to cowl. Luxurious upholstery of very best material throughout. Rear seats are very wide and deep, with plenty of leg room. Front seats are wide and deep, with abundance of room. All electric wiring run through metal tubing to insure perfect insulation.

EQUIPMENT—Foot rail, coat rail, speedometer, motor-driven electric horn, electric headlights, double bulbs, electric tail lamp, license carrier, rain vision, clear vision, ventilating windshield, double faced Fabrikoid top with quick setting curtains, double tire carrier on the rear, jack and repair kit.



"These Standards are the Keystones of Efficiency"

Act Now—and You Lead

"Eights" are unusual this year. The attention of the automobile world is centered on them, and they are scarce.

The Standard "Eight" offers you, now, an opportunity that has not been surpassed in motor history.

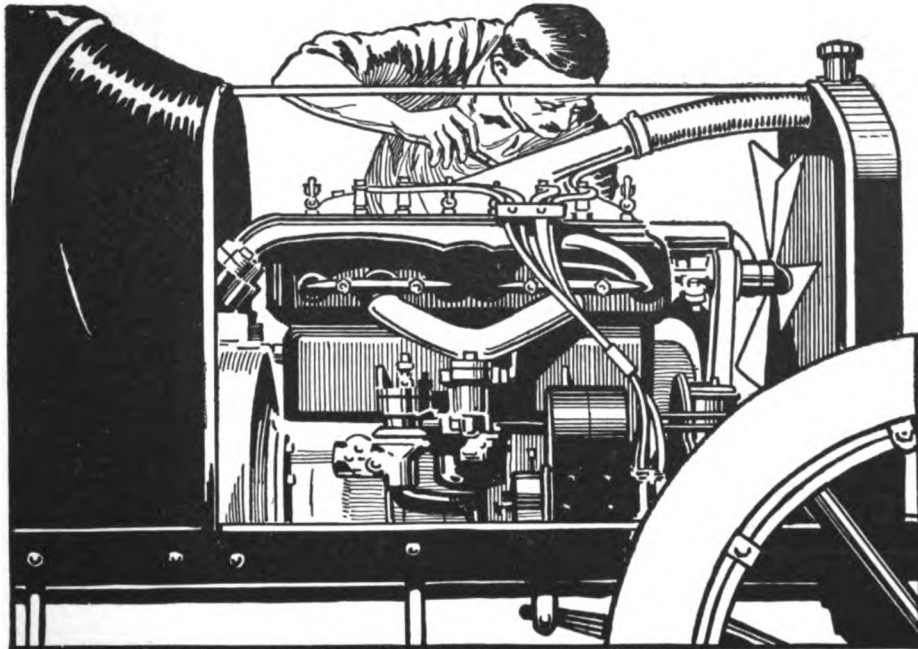
The Standard "Eight" is ready. It has more than withstood every gruelling test. Secure the Standard Agency this year and you lead.

Wait and you'll travel with the crowd. There'll be plenty of "Eights" next year. Your opportunity is now.

Will you lead or follow? Write today for our selling plan and agency proposition.

Standard Steel Car Company
Pittsburgh Pennsylvania

Here's the Combination—



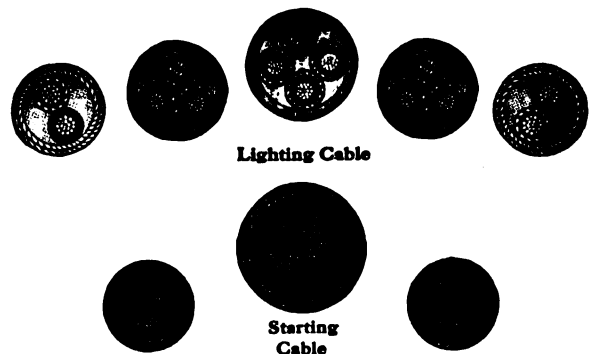
It is a strong guarantee of dependable service — insurance against wire troubles—the car owner's economy and the repairman's best ad—This combination is—

A Good Repair Man
and

Packard

Protected Cable

The experienced repair man knows what oil does to ordinary cable and that "Packard" is really an oil-proof cable. Buy it of your jobber and insist on having genuine Packard cable.



THE PACKARD ELECTRIC COMPANY

DEPARTMENT D

WARREN, OHIO

(115)

When writing advertisers please mention Motor World

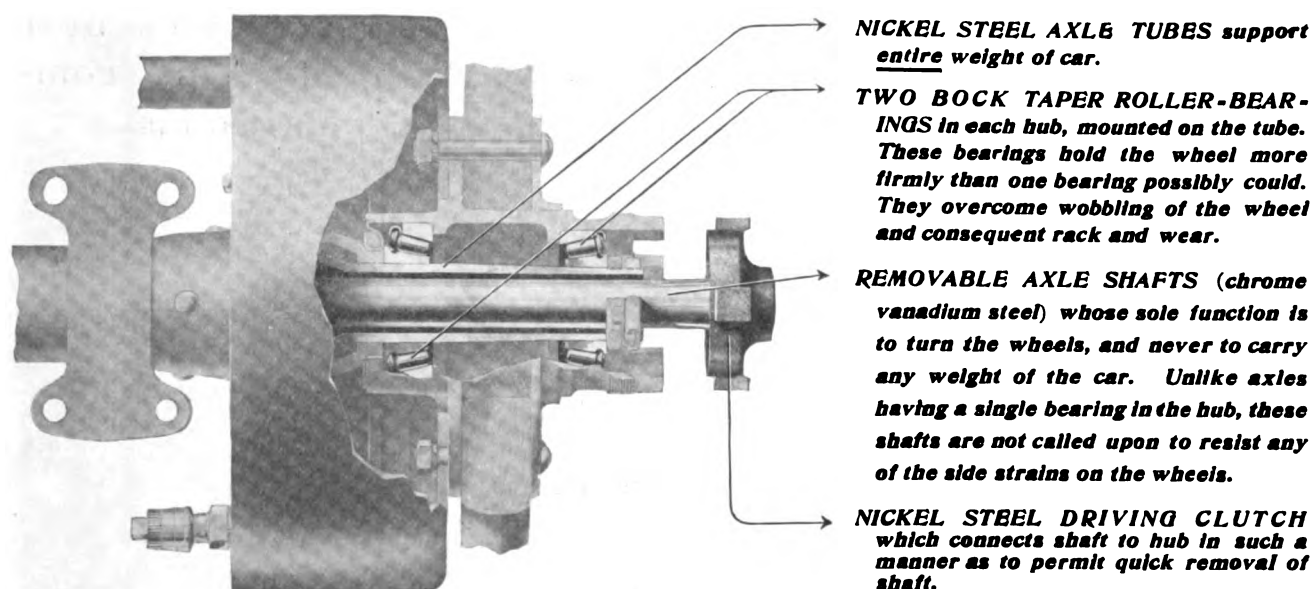
What Is a *Full-Floating* Axle?

The well-known superiority of the *full-floating* type of axle over the less expensive *three-quarter* and *semi-floating* types is the superiority of **QUALITY** and **SERVICE** over Compromise.

What *full-floating* means is the best shown by a glance at the accompanying cross sectional illustration of a portion of the new Full-Floating

American Axle

Equipped with Bock Taper Roller Bearings



As a Result of This Construction

the *full-floating* type possesses many points of supremacy over the *three-quarter* and *semi-floating* types—

GREATER STRENGTH and **SAFETY**, because the strains are more evenly distributed among bearings, shafts and tubes than is possible in the *three-quarter* and *semi-floating* types.

LONGER LIFE because all parts are rigidly maintained in correct relation to one another under the most severe conditions of service.

ACCESSIBILITY—Axle shafts can be removed in a moment, at any time, for inspection and repair without removing the wheels.

THE FULL-FLOATING FEATURE is only one of the many points of superiority possessed by the new Full-Floating "*American*" Axle equipped with Bock Taper Roller Bearings. Write and let us supply you with full details.

Licensed under The Kardo Company Patents

The American Ball-Bearing Co., Cleveland, Ohio

PIONEER AXLE BUILDERS OF AMERICA

It took 90 Days to Dominate the Field

90 days ago, the market offered over 20 starters for Fords.

90 days ago, the GENEMOTOR was hardly known outside the engineering sanctum of the GENERAL ELECTRIC COMPANY.

Today it is known wherever Ford cars are sold.

Today it is the fastest selling starter for Fords.

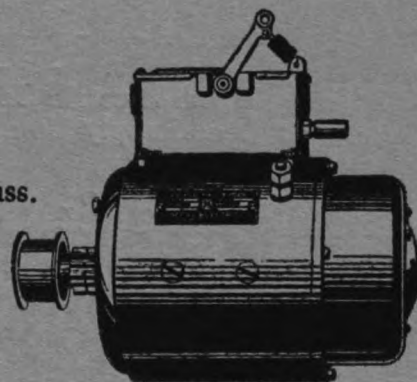
Today the GENERAL ELECTRIC COMPANY is shipping more starters for Fords than all other manufacturers combined.

Today the GENEMOTOR commands the field—dominates it.

In 90 days time, it has assembled, through sheer merit, the strongest and ablest group of accessory distributors in

\$75

F.O.B. Lynn, Mass.



America. These distributors form a vast, nation-wide jury. They weighed the evidence of more than 20 starters for Fords, and rendered a decisive verdict in favor of the GENEMOTOR.

THE JURY

Chanslor & Lyon Co.	- - - - -	Los Angeles, Cal.
Chanslor & Lyon Co.	- - - - -	San Francisco, Cal.
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Excelsior General Supplies Co.	- - - - -	Chicago, Ill.
Fisk Company of Texas	- - - - -	Dallas, Tex.
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Fisk Company of Texas	- - - - -	San Antonio, Tex.
Quaker City Engineering Co.	- - - - -	Philadelphia, Pa.
The Gibson Company	- - - - -	Indianapolis, Ind.
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American Motor Sales Co. and		
E. A. Bowman Company	- - - - -	Detroit, Mich.
Iroquois Rubber Co.	- - - - -	Buffalo, N. Y.
Kaehler Motor Co.	- - - - -	Richmond, Va.
Miller Bros. Automobile Supply House	- - - - -	Washington, D. C.
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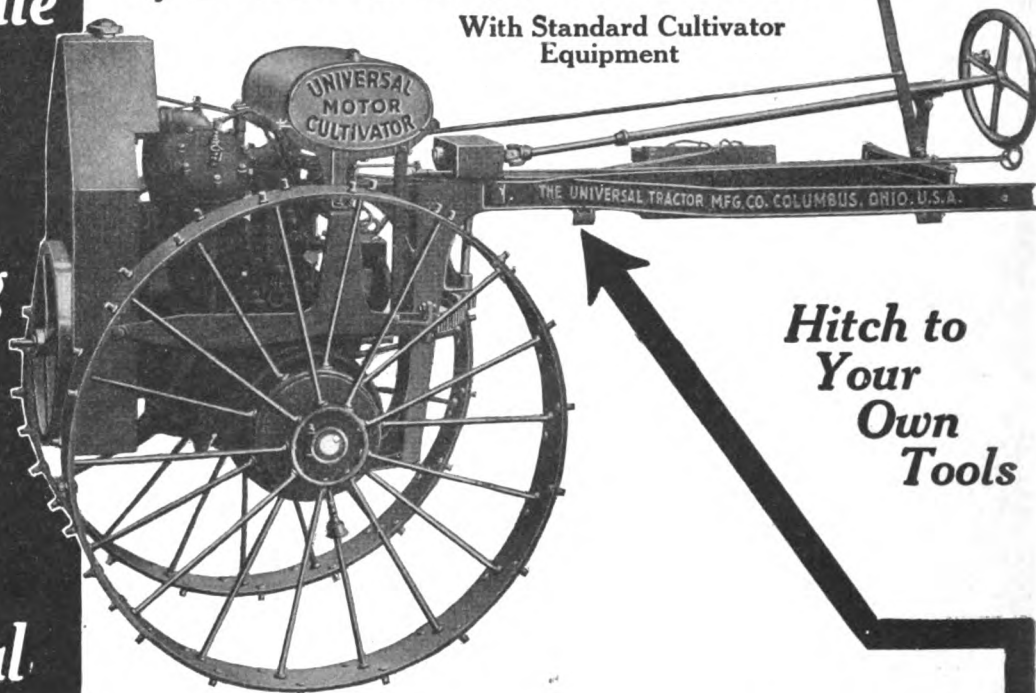
A. J. Picard & Company, *Sole Agents*

1720-22 Broadway, New York

**Automobile
Dealers
Are
Winning
Trade
With
the
Universal**

\$385 f. o. b. Columbus

**With Standard Cultivator
Equipment**



**Hitch to
Your
Own
Tools**

The Universal Motor Cultivator

AUTOMOBILE dealers all over the country are taking advantage of the big opportunity offered by the Universal. Our dealers' contract is generous and fair. The field is the biggest ever opened up.

The Edge Auto Device Co., Edgewater Park, N. J., contracted for their county without seeing the machine. They write that it is more than they expected it to be and that they have 100 prospects already.

Conklin & Spindler, auto dealers, Chicago Heights, Ill., have their demonstrator on hand and closed a regular contract with us for their territory. They are pleased with the machine.

Another concern in the corn belt, the Rossville Auto & Welding Co., Rossville, Ill., have contracted for their territory and their demonstrator is enroute to them.

The Chambers Auto Sales Co., Rome, Ga., one of the big automobile houses of that state have taken over 19 counties. They have contracted to sell 75 machines during the present selling season.

Sidney S. Smith & Co., dealers in autos at Washington, Iowa, have contracted for their city and vicinity, and have demonstrating machine on hand.

Miller Bros., automobile men of Lake Andes, South Dakota, have contracted for their trade territory.

Imperial and San Diego counties in California have gone to F. C. Abrams & Co., automobile dealers, San Diego, Cal.

Chas. W. Travis, Evansville, Ind., of the Travis Automobile Co., is an expert in automobiles, pronounced our machine to be all that our catalog claimed for it after carefully examining it. He contracted for his territory before leaving Columbus, and reports that he has things moving along in great shape.

L. Faverio, Greenwich Village, Mass., an automobile dealer believing that the Universal will be a profitable addition to his business, has contracted to handle our machines in his territory. He says the machine is more than he expected.

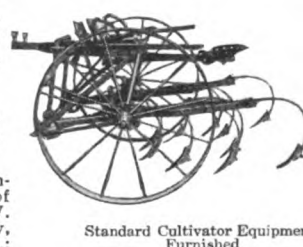
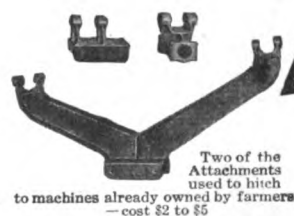
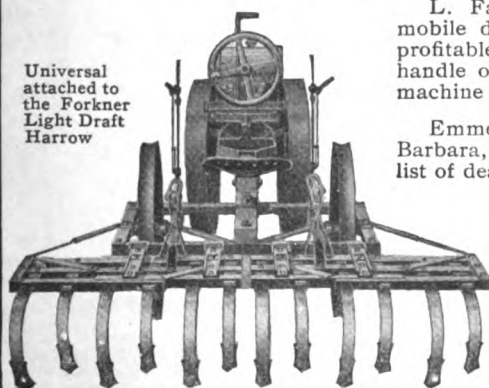
Emmett G. Ord, an automobile man of Santa Barbara, Cal., is the latest member of our ever growing list of dealers.

Other live auto dealers who have recently contracted to handle Universals are F. O. Arnold of Waco, Texas; Harry S. Jones, Eustis, Fla.; J. W. Pitts, Troy, N. Y.; Phillip H. Kelley, Forest City, Iowa; L. G. Schoepflin & Co., Buffalo, N. Y.; Rochester Gas Engine Co., Rochester, N. Y.

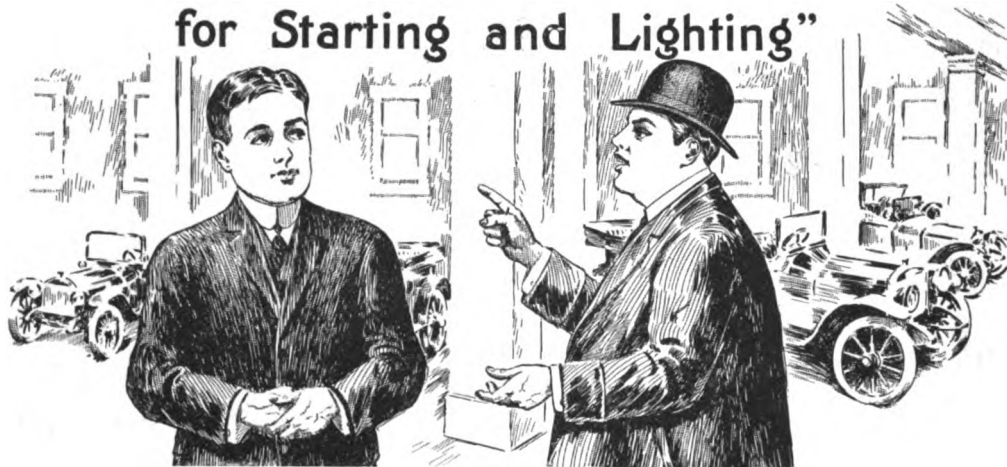
Write for book "C" and get our proposition for your territory. The opportunity is ripe. DON'T WAIT!

Universal Tractor Mfg. Co., 2022 South High Street Columbus, O.

Universal
attached to
the Forkner
Light Draft
Harrow



"I'LL BUY on condition that you equip with **GOULD BATTERY** for Starting and Lighting"



Who Has the Best Judgment, "A" or "B" ?

"A" took the starting and lighting battery that was handed him. Mr. Dealer made a fine profit, but soon Mr. "A" noticed that his cranking power would die down suspiciously quick. In winter the battery had to be 'brosted.' Acid crept out and corroded the terminals. One cell wouldn't equalize with the others, and like a weak chain link, pulled down the whole capacity. During the trouble periods, Mr. "A" found that hard cranking was no lost art.

"B" said "none but a *Gould* Battery goes on my car, even if the cost is a little more." Three years later he was able to conscientiously tell a friend. "My battery still works as well as when I bought it and I've never yet used the crank. Battery troubles simply don't exist with me."

The question of judgment here is intensely practical.

**Gould
Storage Battery
Gould**

A good battery is essential to motoring comfort and assurance that your car is always ready.

Batteries built to sell at a price can't be expected to give service. We prefer to build for service—and Gould Battery users agree that we do.

**Gould
Storage Battery
Gould**

Gould Storage Battery Co.

Genl. Offices, 30 E. 42nd St., New York

Works at
Depew, N.Y.

Boston, 347 Newbury St. Philadelphia, 613 Lincoln Bldg. Cleveland, 1761-5 E. 18th St. Detroit, Kerr Bldg. Chicago, 225 E. 22d St. San Francisco, 1448 Van Ness Ave. Los Angeles, 118 E. Pico St.

Agents in Washington, Rochester, Buffalo, Pittsburgh, Milwaukee, Minneapolis, St. Paul, Kansas City, Omaha, Denver, Topeka, Seattle.

Canadian Representative, R. E. T. PRINGLE, Toronto, Montreal, Winnipeg, Vancouver.

Full stock of parts, plates and repairs carried by all offices and agents.

(145)

Firestone

Tires Win Venice Grand Prix Race at Los Angeles

Barney Oldfield in a Maxwell finishes first, traveling three hundred and one miles at sixty-eight and one-half miles per hour

Without a Stop

OVER this hot macadam road, which ground down tires like a giant emery wheel, Firestone Tires again achieved an international victory March 17. Ninety-seven laps were covered in this race, which meant that each of three right-angled turns were rounded ninety-seven times, an additional terrific tire test. Out of nineteen entrants only six finished the race.

Again—On Same Tires—Oldfield Wins 100-mile Race at Tucson

On March 20th, at Tucson, Arizona, Oldfield won the 100-mile Race without a stop, using the identical set of tires on which he won the 300-mile race at Los Angeles.

Last November in the Los Angeles-Phoenix road race, celebrated "Cactus Derby," Firestone Tires finished first, second and third, and in the El Paso-Phoenix road race, run at the same time, Firestones won first. These three grueling races over 1,300 miles of unfrequented mountain and desert roads also put tires to unprecedented tests. Study the reasons for this service in the illustration and compare Firestone prices with the prices of ordinary tires. Then you will always use the tire of "*Most Miles per Dollar.*"

Actual Size 5-inch "Non-Skid" FIRESTONE

Fig. 1. 7 plies of Sea-Island fabric in Firestone —some are satisfied with 6.

Fig. 2. Extra coating of finest rubber between fabric layers in Firestone —not in the ordinary.

Fig. 3. 1/8 inch Pure Para Rubber cushion layer in Firestone —none in the ordinary.

Fig. 4. 3-32 inch Breaker Strip of Sea-Island fabric and high-grade rubber in Firestone —less in the ordinary.

Fig. 5. 1/8 inch Tread, tough, resilient, gripping in Firestone —less in the ordinary.

Fig. 6. 1/8 inch side wall of strongest rubber in Firestone —less in the ordinary.

Fig. 7. Firestone Bead, Built into tire specially for clincher rims in Firestone.

In the ordinary tire the clincher part of bead is only a patch applied to straight side type to fill "clincher" space.

Yet you pay only \$39.80 for this 37x5 inch Firestone NON-SKID—20% below the average of four widely advertised makes.

Firestone Tire & Rubber Company

"America's Largest Exclusive Tire and Rim Makers"

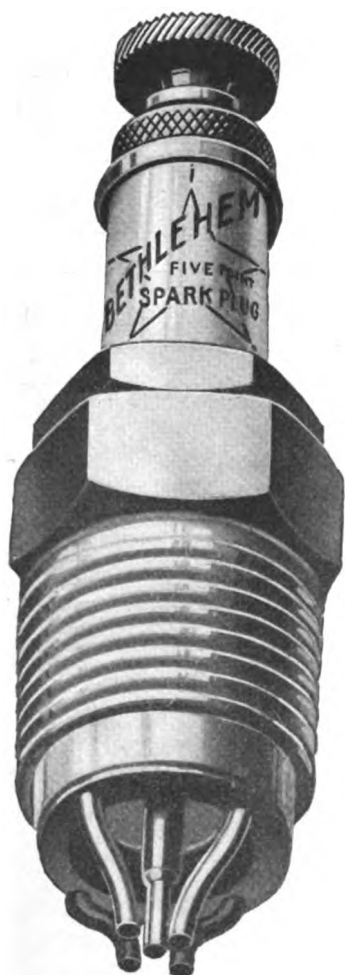
Akron, Ohio—Branches and Dealers Everywhere

Firestone Net Prices to Car Owners

	Case Round Tread	Case Non-Skid	Grey Tube	Red Tube
30x3	\$ 9.40	\$ 10.55	\$2.20	\$2.50
30x3½	11.90	13.35	2.60	2.90
32x3½	13.75	15.40	2.70	3.05
34x4	19.90	22.30	3.90	4.40
34x4½	27.30	30.55	4.80	5.40
36x4½	28.70	32.15	5.00	5.65
37x5	35.55	39.80	5.95	6.70
38x5½	46.00	51.50	6.75	7.55

BETHLEHEM ^{FIVE POINT} SPARK PLUGS

WHAT THEY ARE:



The word BETHLEHEM means to almost everyone—the highest grade of steel—the highest grade of engineering and mechanical skill.

The town of Bethlehem calls to it the most skillful steel workers in the world. The Bethlehem Steel Works are famous for the superiority of their product.

Mr. Charles M. Schwab, President of the Bethlehem Steel Company, is also President of The Silvex Company.

Could we say more as to the money, the brains, the engineering skill that have gone to create the Bethlehem Plug, and to insure its mechanical perfection?

There is a real basis for our guarantee—the strongest ever put on an accessory—

Guaranteed for the Life of the Car.

Sell Bethlehems and you give your customers better service and make more money yourself. \$1.25 each and worth it!

The new Bethlehem Display Case offers a complete assortment—a type for every motor at a minimum price—\$25.00—the Case itself costs you nothing. Write us!

THE SILVEX COMPANY,

Factory: South Bethlehem, Pa.

171 MADISON AVENUE, NEW YORK

Pacific Coast Branch: Oakland, California
W. N. Davidson, Manager



For the quarter century just passing we have held the dominating position in the vehicle industry—particularly the last fifteen years, during which time we have specialized on the development and production of springs of all types and sizes for the various kinds of motor driven vehicles.

In all this time we have never been able to discover any actual practical merit in features.

As time goes on the more firmly we are convinced that the relative value of anything other than scientific design—exact selection of materials—skill in heat treating—absolute integrity in applying the lessons learned from break-down tests is nil.

In arriving at this conclusion we are not alone, for the experience of the world's foremost automobile engineers has substantiated it.

The above illustration shows a section of one of our heat treating departments—where one of the most important stages in the manufacture of Sheldon Springs takes place.

In this department the equipment is more complete and up-to-date, practice is more exact, and the skill and experience of the operatives—from engineers down—more comprehensive than can be found anywhere else in the world.

THE SHELDON AXLE & SPRING COMPANY

Makers of Springs and Axles for Heavy Duty Service for More Than 50 Years

WILKES-BARRE

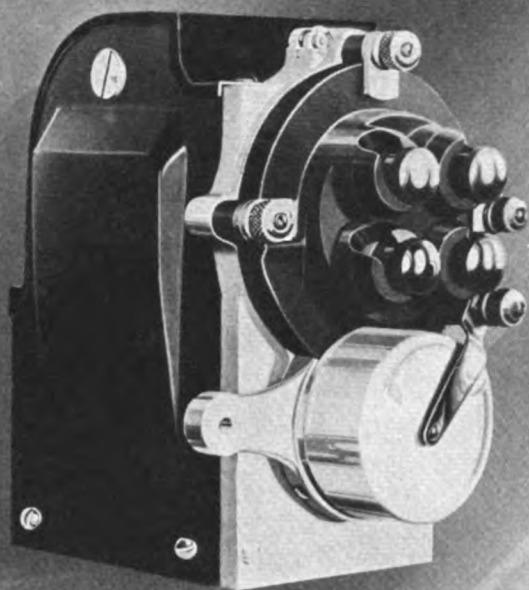
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PENNSYLVANIA

DIXIE ***20TH*** ***CENTURY*** ***MAGNETO***



ASTAGE COACH Suited Our Ancestors

but nothing will suit the
motorist demanding the best
in ignition but the

DIXIE

An intense spark at very
low engine speed, increasing
in intensity to top engine
speed with none of the lag
at higher speeds associated
with timer distributors—
this is the

20th Century DIXIE



Splitdorf Electrical Co.
NEWARK, N. J.

*(All SPLITDORF features are fully
covered by patent or patents pending)*



SAXON \$395



"Sweet Land of Liberty"

To the Saxon owner, America becomes in a new sense the "sweet land of liberty." The region "just beyond the hills" or the show places of the continent are alike within your reach.

You can go anywhere you want, in your daily business rounds or out on pleasure tours, in this sturdy, willing car. No roads are too rough and rugged for it; no mountain climb too difficult.

Letters from all parts of the country tell of the stylish Saxon's never failing and economical performance.

Mrs. Ray M. Mackey, of San Antonio, Texas, writes: "My Saxon is very easy on tires and gasoline. It has the power to climb hills on country roads and to get in and out of traffic on crowded streets without difficulty. I like its neat and up-to-date appearance."

Two Saxon owners, G. W. and J. W. Logan, recently drove from their home city, Tiffin, Ohio, to Los Angeles, California, over every possible condition of road—at a total cost for car operation of \$38.60.

Ideal Car for Every Day Motoring Needs

Mrs. E. J. Parenteau, of Pittsburgh, says: "I have driven my Saxon about 5,500 miles and have found it ideal for country driving as well as city use—at an exceedingly small upkeep. On a recent trip from Pittsburgh to Monongahela, we took the wrong road, covering a route where no automobile had ever gone before. So we feel quite proud of our Saxon."

Dr. E. J. Marsh, of Oswego, N. Y., gives this testimony: "I have driven my Saxon

nearly 3,000 miles. There isn't a prettier working engine in the world." From Paul E. Reiff, Saxon owner, in New Cumberland, Pa., comes this evidence: "The car does the work to my entire satisfaction and can climb hills on high gear that lots of machines are obliged to take on second."

Every Added Pound Costs More to Buy and Keep

Every automobile maker today is striving for light weight in design and construction. Why? Simply because light weight means economy. It makes possible a lower first cost and a very, very much lower after cost.

A few years ago it was different. People rightly expected then to find quality only in heavy, bulky cars. But materials

have greatly improved. Steel makers, for instance, have discovered ways of adding strength and saving weight in steels. The Saxon engineers, taking advantage of these and other improvements, are able to produce a car that is light in weight, yet a marvel for strength and endurance.

Extravagance and False Pride Not Popular

No one apologizes any longer for riding in a low priced car. We no longer have any sense of false pride. It used to be fashionable to be extravagant. Now it is fashionable to be economical—to get the most service for your dollar.

The 1915 Saxon has many improvements which make it even more desirable than before. Saxon is the modern car—distinctive, graceful. It is a car you'll be proud of. It is thoroughly up to the minute in every detail. Electric lights and starter, specially built for the Saxon, furnished when desired, as extra equipment.

We sell the Saxon car with the absolute confidence that on the average, year in and year out, under all kinds of conditions, it will carry its owner whatever number of miles he wishes to go at less expense than any other automobile

Saxon "Six" \$785

This is a big, handsome five-passenger car—of exceptional value. It is fully equipped, including Gray & Davis electric starting and lighting system, and has features usually found only in cars of much higher prices. 112-inch wheelbase, roomy, comfortable streamline body, cantilever springs, 32 x 3½-inch tires, demountable rims, one-man top, speedometer.

The demand for Saxons is increasing daily. The merit of this car backed by our nation wide publicity is making the Saxon line still more popular with public and dealer alike. Some territory is still open. We urge prompt action—write today for literature and full information about opportunity in your locality.

Address Dept. N

SAXON MOTOR COMPANY
Detroit, Mich.

When writing advertisers please mention Motor World



HORN PRICES

BANG! Away they go!

War in Europe may be bad, but war in horns is **EXPENSIVE**.

The more expensive the war is to the horn manufacturer, the more profitable it is to the purchaser.

That's why the remarkably efficient, high-class **CLERO**—New England made hand-operated horn is sold at \$3.50.

Down, down, **DOWN** comes the price—but up, up, **UP** goes the quality of the horn. Today the man who isn't equipped for manufacturing the highest grade horn simply can't stand the competition at all. But here in New England, where we have the best facilities,

A Confidential You, Mr.

You know that the monopoly price on horns has been maintained by fictitious patent claims and not by the cost of manufacture. The **CLERO** Horn pays no royalties and has no big overhead, it stands upon its own bottom—where a big production, efficient manufacture and wholesale distribution make the price to the consumer attractive, and the profit to the dealer the best.

Besides, the **CLERO** Horn is being widely advertised through the trade and class papers. This will create a tremendous

\$3.50

New England Made for Nation Trade

\$350

SHOT TO

the best trained mechanics and the most intensive form of manufacture, we are able to make a horn of unsurpassed quality at a surprisingly small production cost.

The CLERO has the quality, has the tone, the endurance, that is not quite equalled by the next best article made, regardless of what they ask for it.

Word With Dealer

demand for the best horn at the right price and you should supply that demand.

If interested in such profits, let us hear from you at once.

**FITZGERALD MANUFACTURING
COMPANY**
Torrington, Conn.

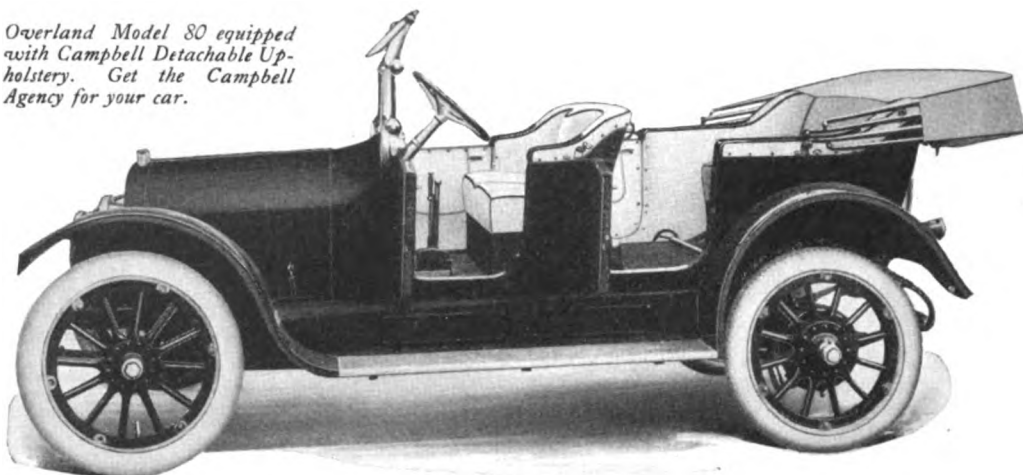
CLERO LONG PROJECTOR

\$4.00

The same high-class construction as the standard CLERO, but with a longer projector; 50 cents more; price, \$4.00. There is not a stronger, clearer, more durable or more satisfactory horn made.

CLERO

Overland Model 80 equipped with Campbell Detachable Upholstery. Get the Campbell Agency for your car.



This button guarantees fit, wear, satisfaction

IMPORTANT NOTICE TO DEALERS Reduced Prices! ON CAMPBELL DETACHABLE UPHOLSTERY

Owing to the enormous volume of business in 1914, we have been able to reduce our overhead and therefore selling costs on Detachable Upholstery 60 per cent, and are giving the dealer the advantage of this saving.

And remember this! Every set of Campbell Detachable Upholstery is cut, fitted and tailored as carefully as ever; better, in fact, because our methods are being constantly im-

proved. The reduction in price does not in any way mean a sacrifice in the high quality of fit, workmanship and wear that have made Campbell the leader in the field.

Write us for new price list and our money-making agency plan. It means little or no investment for you and big profits. Write us today.

CAMPBELL GUARANTEED MOTOR CAR ACCESSORIES



Percama—The Big-Selling Cleaner

Takes grease, dirt, dust, oil out of tops, upholstery, slip covers and rugs. Non-explosive, will not injure water-proofed materials. Retails for 25c per quart, enough to clean a touring car top.

Ford Dealers and Owners, Read This

The Campbell Latigo Ford Fan Belt is the biggest seller in "Ford-dom." Retails for 50c. Outwears ten ordinary belts. Write for details and trade discounts. Investigate our full line of Ford accessories and our new low-priced, high quality Ford Seat Covers.



Write for Catalog and Trade Discounts

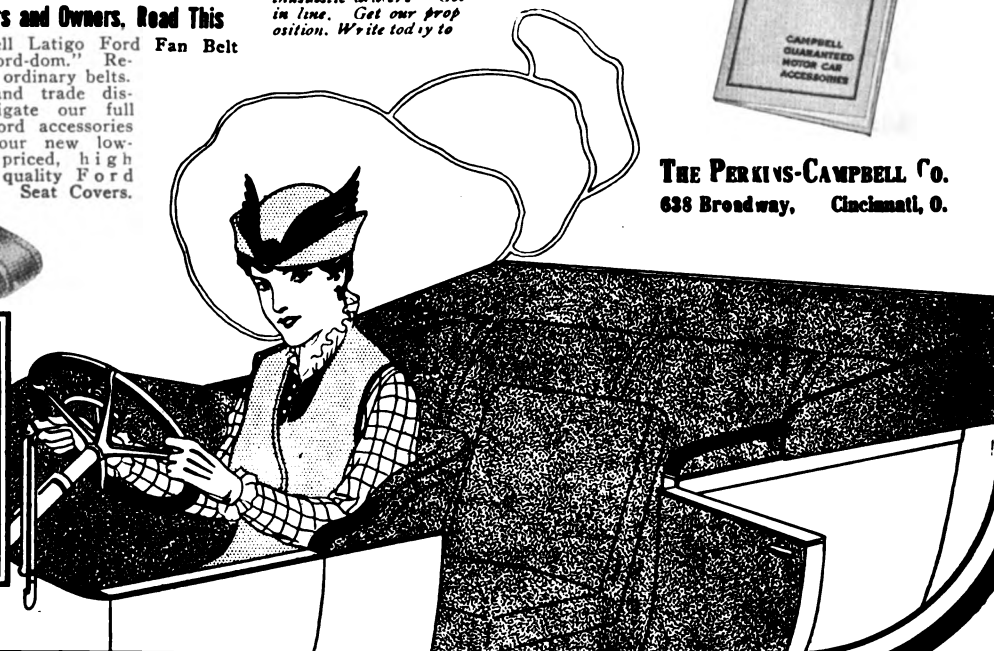
We have an interesting story to tell every garage man, supply dealer, repair and paint-shop man, and car agent. Our guarantee of satisfaction, together with our unexcelled line of accessories, is a strong asset to you and your business. We have thousands of enthusiastic dealers. Get in line. Get our proposition. Write today to



THE PERKINS-CAMPBELL CO.
638 Broadway, Cincinnati, O.

CAMPBELL

makes sure
you're
satisfied



When writing advertisers please mention Motor World

A STEADY MARKET

If you are reading the signs of the times correctly, you cannot have failed to note the tendency of more experienced motorists toward the use of closed cars for both summer and winter driving—summer as well as winter.

If there were no other considerations than the comfort a closed car affords—even in hot weather—that benefit is weaning people away from the open body which leaves them exposed to wind and dust and which compels them to use dusters, goggles, veils, gauntletted gloves, etc.

The Springfield Demi-Convertible Body is the latest and most practicable type of all season, all purpose body.

Its use does not restrict the motorist as to how far nor how fast he may care to go. In winter it gives absolute limousine comfort and protection—in summer it enables its occupants to get all the air they want—to wear conventional clothes and not be subjected to the battering of the wind, the effects of the sun, the inconvenience of sudden showers or the disagreeableness of dusty roads.

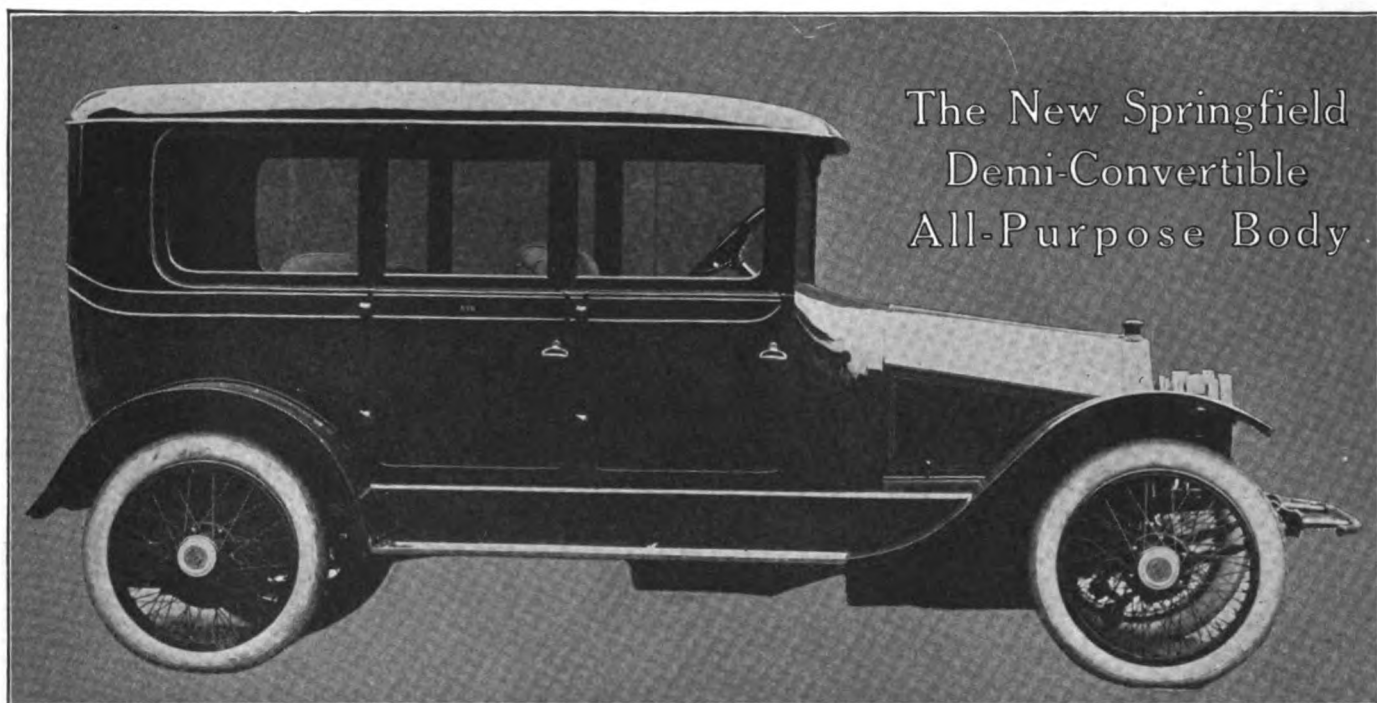
Talk to your customers along this line. They will be quick to see the logic of your remarks. Every sale you make means more profit to you and a better satisfied customer.

THE SPRINGFIELD METAL BODY COMPANY

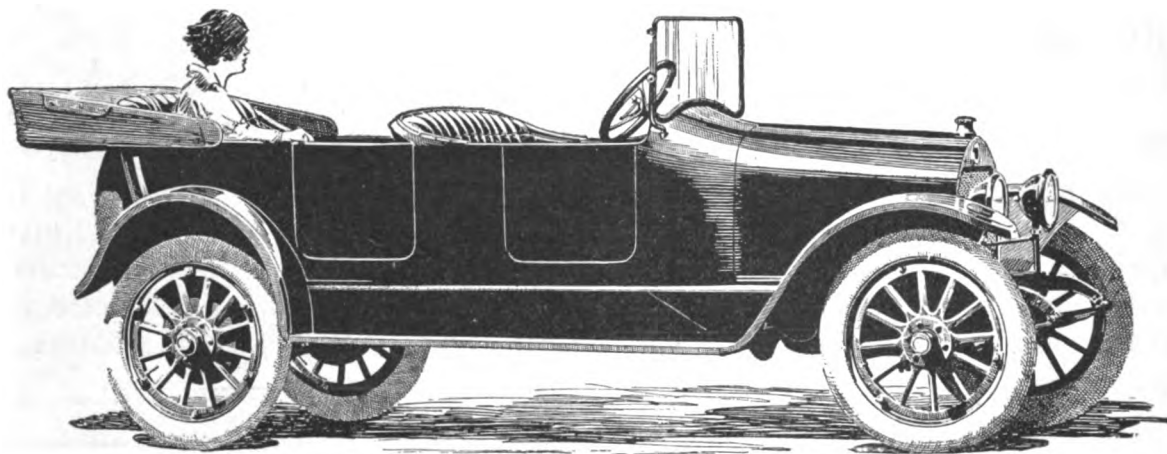
Springfield, Massachusetts

New York Office:

1737 Broadway



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Quality

Where others leave off Jeffery begins. Compared with other cars of the same price class using materials and equipment that are "good enough," Jeffery pays the additional cost for the best.

Motor starter—\$35 more on the Sixes.

\$90 more on the Light Four.

Ignition—\$15 more for Bosch.

Transmission—\$35 more for four speeds.

Tops—\$10 more for finish and materials.

Upholstery—\$25 more for quality, leather and real curled hair.

Worm drive—\$50 more for the most advanced design.

These are only a few points. They apply in equal proportion throughout Jeffery construction.

In quality, beauty, workmanship, comfort and economy Jeffery leads.

The Thomas B. Jeffery Company
Main Office and Works, Kenosha, Wisconsin

When writing advertisers please mention Motor World



"G-R-C" Wire Wheels

With Demountable--Detachable Rims

Strongest of All Wire Wheels

This is the **only** wheel with quadruple lacing (spokes in four planes), giving maximum side strength. And the **only** wire wheel having a boltless demountable rim—no nipples or spoke ends in contact with the tire.

All four wheels remain attached permanently to the car; spare tire is carried on spare rim. In making a tire-change, you have only to consider weight of tire and rim.

Among the many advantages of "G-R-C" Wire Wheels are greater strength and safety, superior riding ease, less strain on tires, and exceedingly attractive appearance.

Rim Locks and Unlocks From a Single Point in 15 Seconds

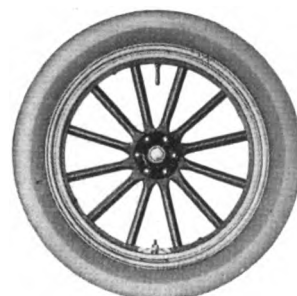
THE "G-R-C" RIM is the quickest-acting of all rims. There are no series of nuts, bolts, wedges, clamps or other loose parts to take off and put on; no adjustments or complicated parts; no knack or experience is required. There is just **one nut** to turn, and it takes only 15 seconds to remove or put on the rim. A ratchet wrench is the only tool required.

FURTHERMORE, the rim is locked to wheel around its entire circumference and has continuous bearing-support upon wheel band. No danger of tire being forced out of round; no possibility of rim squeaking. Locking device is placed opposite valve stem and spreader, **balancing their weight.**

TO REMOVE tire from spare rim, insert pins of rim tool into corresponding holes in rim and draw rim to smaller circumference, thus freeing the tire.

Let Us Send You Full Information

GENERAL RIM COMPANY, SWETLAND BUILDING,
CLEVELAND, OHIO



The same rim equipment can be applied to wood wheels.

Passed by the Clincher Automobile Tire Manufacturers' Association.

Just as Good as the Highest Priced

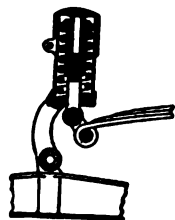
A SET OF 4 FORD "O-G" SHOCK
ABSORBERS FOR ONLY \$9

"O-G" Shock Absorbers are easily worth twice what they cost but the tremendous facilities for quantity production have made possible this low price.

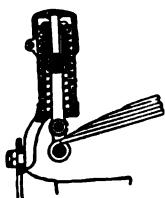
"O-G" Shock Absorbers can easily be attached by Ford owners themselves in 15 minutes.

Adjustable when placed on cars and automatically adjusted in service.

Sold with a guarantee that covers workmanship, material, finish and satisfactory service during the use of the car.



Mail us a check and we will send you a set with instructions for attaching, or write us at once for particulars.



OXYGEN GENERATOR CO., Inc.

301 RIVER STREET

Complete Generating and Decarbonizing Outfit for \$15.00

Sold with complete equipment, extremely economical to operate and guaranteed in every particular.

A generator not too large for a small garage or shop, but with capacity great enough for the largest.

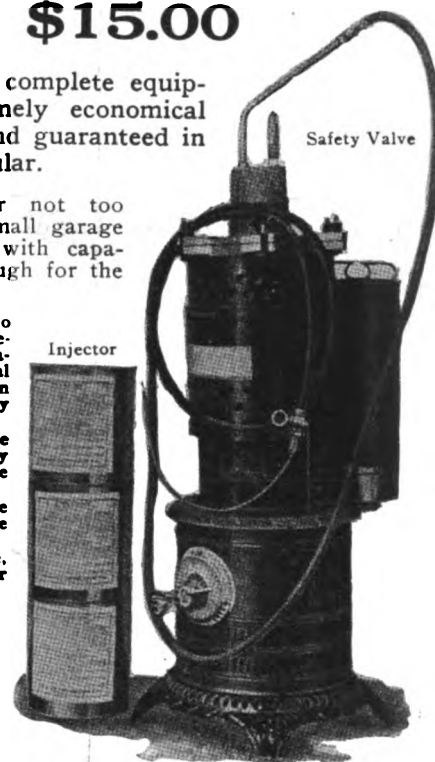
No tanks to bother with, no delay in securing material. A practical equipment that can be operated by any one.

Carbon can be removed from any cylinder in three minutes.

Oxygen can be generated in three minutes.

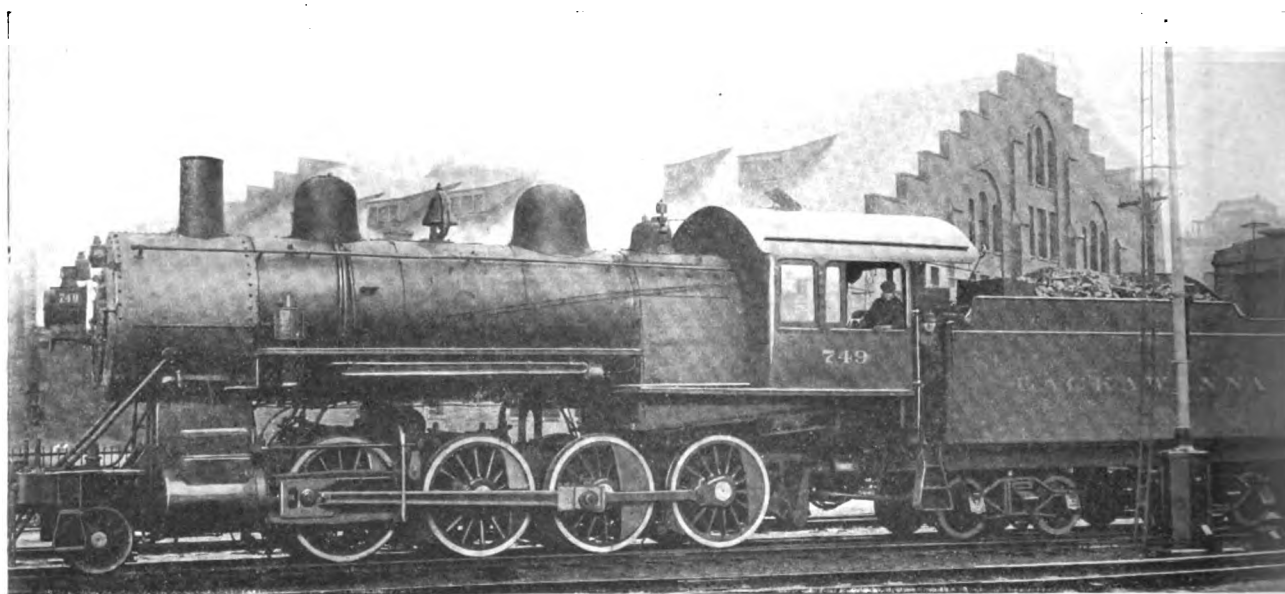
It is a time, money and labor saver.

Write today for particulars



When writing advertisers please mention Motor World

BIGGEST SINGLE SHIPMENT OF



Train-load Sold Second Train-load

ON February 24, the Franklin Car opened the new era in fine motor cars—with the shipment of a *full train-load* to four cities in the States of Washington and Oregon.

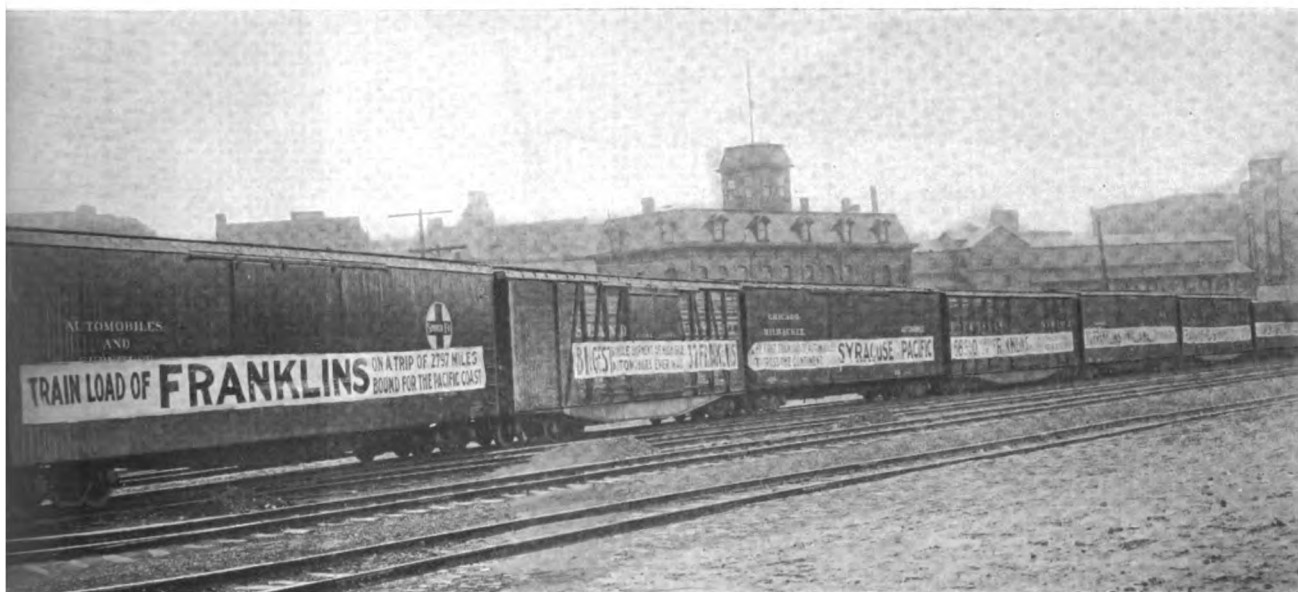
More than that, while the first train-load was being delivered, duplicating orders came to the Franklin factory by wire—and the second train-load started on its way March 25th.

Two train-loads of Franklin Cars absorbed by one limited section in twenty-nine days—with fifty other sections all over the country showing a remarkable growth in the demand for Franklin Cars!

In the East the demand for Franklin Cars during the past four months has increased 84 per cent. over last year.

The Central States show an increase of 27 per cent. for the same period.

FINE AUTOMOBILES EVER MADE



Out in 29 Days - Ordered by Wire

The Pacific Coast an increase of 30 per cent.

And the Spring buying season is just opening.

To the man with his eyes open to the facts—to the comparative figures of sales among different makes and grades of cars—to public opinion and what motorists are thinking about—there can be no doubt that the Franklin is the car of today.

Tire mileage, gasoline economy, service value in relation to first cost—your motorist knows the facts today as never before. On these facts he is building *new buying standards*—and they are leading him straight to the Franklin Car.

FRANKLIN AUTOMOBILE COMPANY
SYRACUSE, N. Y.



The Stonebridge Easy Clean Spark Plug

Is the only spark plug that can be cleaned instantly without removing from the engine. To remove carbon from the sparking points it is only necessary to press down on the cap and twist it around a few times. The plug may be cleaned in an instant every day without removing from the engine, so that you may have clean plugs every time you take out your car.

We Actually Pay Your Advertising Bills

This is not an idle statement but actual fact.

We will pay 25% of all money you pay us to any local newspapers or other useful advertising media in your town that you may select. We furnish the electros of complete ads with your name at the bottom.

Stonebridge Easy Clean Spark Plugs are in great demand. If you do not handle them you are wilfully losing money.

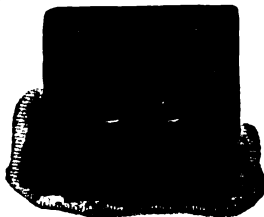
With the free advertising we give you—not only do you derive profits on Easy Clean Plugs—but your entire business is increased many-fold. With every sale of Easy Clean Plugs you gain a friend.

Communicate with us at once and we will send full particulars.

STONEBRIDGE SALES COMPANY, 10 Wall Street, New York, N. Y.
S T O N E B R I D G E



Eliminates Adjustment



Goodyear Quick-Repair Outfit

There's no money in tire adjustments, no matter what tire you sell. Each one cuts you out of a re-sale.

You can put an end to the adjustment trouble. Just get your customers to carry a Goodyear Quick-Repair Outfit. Show them how to prevent big tire troubles by mending the little ones promptly.

RESULT—The tires will long outlast their rated mileage. You will make a good profit on the repair outfits. And you will

make tire sales where you now make adjustments.

Each outfit contains quick-repair gum, self-cure tube patches, blowout patch, patching cement and emery cloth. All packed in a neat screw-top can for 80c retail. This is No. 8 of the 22 Goodyear "Tire Savers." Ask us about our Free Show-Case offer. Address Desk 126



The Goodyear Tire & Rubber Co., Akron, Ohio
Makers of Goodyear No-Rim-Cut Automobile Tires (2087)



Link your motor to the **BIG BOY**—the big plug for big deeds



Big Boy	\$1.00
Regular .....	.75
Priming	1.25
Combination	1.25
Platinum Point	1.50

EMIL GROSSMAN MFG CO., INC.
Bush Terminal Model Factory No. 20
Brooklyn (New York City).

**THERE IS MORE POWER IN
THAT GOOD GULF GASOLINE
AND
SUPREME AUTO OIL
MANUFACTURED BY
GULF REFINING COMPANY
PITTSBURGH, PA., U. S. A.**

Dealers—Write for our attractive proposition
—Send for our free booklet "Progressive Lubrication"

MARMON
"The Easiest Riding Car In The World"

"41" \$3250 132" Wheelbase	"48" \$5000 145" Wheelbase
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Nordyke & Marmon Company
Indianapolis (Established 1851) Indiana
"Over Sixty Years of Successful Manufacturing"

When writing advertisers please mention Motor World



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The low selling price of the car you buy or sell is no argument that its ignition system should be less reliable than the best.

The Bosch Magneto may cost the car makers a trifle more per car, but the difference is so slight and the importance of ignition so vital that any argument of the "can't afford it" or "it's just as good" nature is completely refuted.

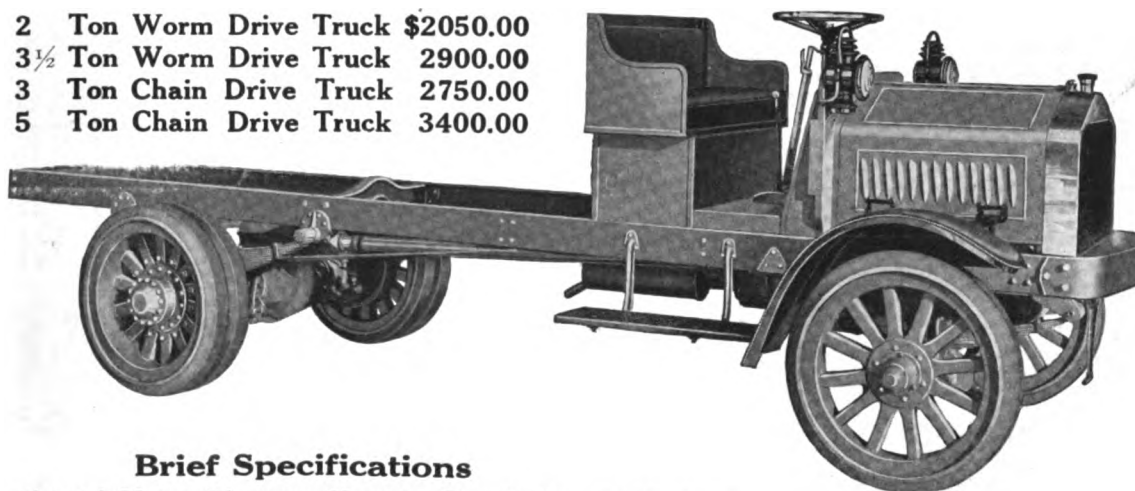
It is highly advisable to insist that the car you buy or sell, is Bosch-Equipt.

Correspondence Invited

BOSCH MAGNETO CO., 224 West 46th Street, New York
 Chicago—Detroit Over 250 Service Stations San Francisco—Toronto

The United Line

- | | | |
|----|-----------------------|-----------|
| 2 | Ton Worm Drive Truck | \$2050.00 |
| 3½ | Ton Worm Drive Truck | 2900.00 |
| 3 | Ton Chain Drive Truck | 2750.00 |
| 5 | Ton Chain Drive Truck | 3400.00 |

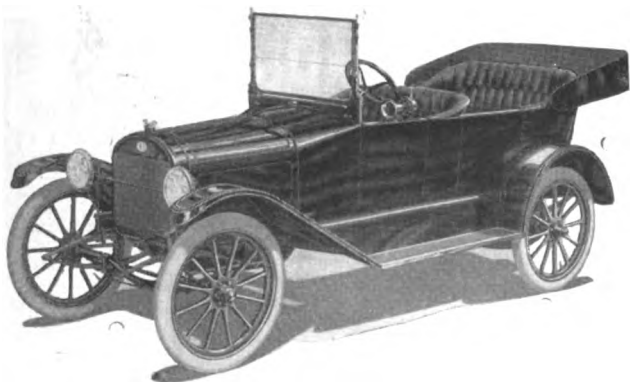


Brief Specifications

Continental Motor, Eisemann Magneto, Stromberg Carburetor, Mayo Radiator, Brown-Lipe Transmission, Perfection Springs, Timken Front Axle, Timken Rear Axle, Timken Bearings throughout, Gemmer Steering Gear.

Territorial Sales Managers now closing contracts. One demonstrator enables dealer to show entire line. Dealers' inquiries handled in order of their receipt. Write or wire.

UNITED MOTOR TRUCK CO. Grand Rapids Michigan



METZ "25"

The Quality Car

A GREAT BIG PROPOSITION FOR DEALERS

This new Metz Touring Model will help you to do a much bigger business, and a very profitable business. The demand for just such a car as this will show a greater increase this year than ever before.

Listed at \$600, its equipment includes Gray & Davis electric starter and electric lights, rain-vision windshield, one-man top, luxurious upholstery, 32-in. wheels, 3½-in. Goodrich clincher tires, Bosch magneto, Hyatt bearings, gasoline gauge, speedometer, signal horn, tools, etc. It is a handsome appearing car, a car any owner will be proud of, and so simple in operation that a woman can safely drive it. It will pay you to handle the METZ.

Write for particulars and New Catalog "B"

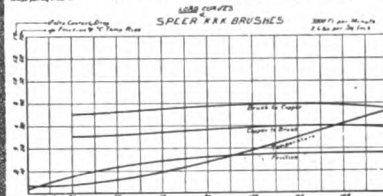
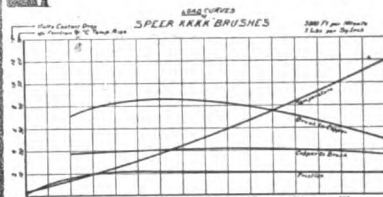
METZ COMPANY, Waltham, Mass.

HIGH CONDUCTIVITY BRUSHES

SPEER Composition - Metallic Brushes have compelled recognition of a carrying capacity far above the limits of carbons and graphites with the minimum of brush and commutator wear.


Our grades KKK and KKKK have a range between 6 and 40 volts and are capable of 110 and 150 amperes respectively per square inch.

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These brushes are a necessary factor in obtaining the highest efficiency in generators and motors for high speeds and high current densities.

Speer Carbon Co.
St. Marys, Pa.



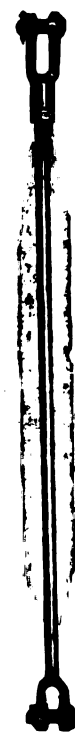
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AND

COMPLETE BRAKE ROD ASSEMBLIES

Your Dependable Source of Supply.



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10 minutes by
"Broadway" Cars
from
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and
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Official Hotel A.C.A.
and A.A.A.

New and Fireproof
Strictly First-Class

Rates Reasonable

**\$2.50 with bath
AND UP**

Make early reservation
for Show Week



H. P. STIMSON

Formerly with Hotel Imperial

Headquarters for Automobilists



America's
Pioneer
Power Pump

Sold on
30-Day
Free Trial

MAYO SPARK PLUG PUMP

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MAYO Ford PUMP
Complete with hose, gauge, all connections, Price \$8
Liberal Discounts. Our advertising will help you sell pumps. Write us.

MAYO MFG. CO.
65 E. 18th St. CHICAGO

COMPLETE
\$10
WITH GAUGE



The AERMORE

Exhaust Horn

Big Dealer Profits

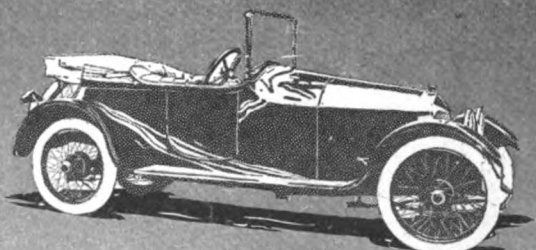
The AERMORE is listed in probably 90% of the 1915 jobbers' catalogs. We are advertising in the leading automobile papers. The fast-growing demand for it means many sales and much profit for you.

Put It in Stock

It gives perfect satisfaction because: it is musical; cannot clog; never fails; cannot be tampered with when car is standing; has no up-keep expenses; amply warns but does not frighten; it is easy to put on.

Send for full description and 1915 discounts.

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It is the one light car that Madame or Mademoiselle can drive with pride.

It is the one light car that the prosperous business man can afford to drive.

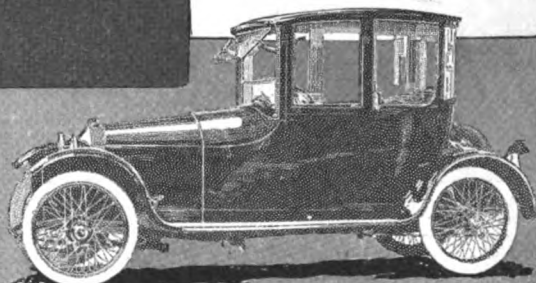
Scripps-Booth


cars offer everything in motor car perfection, refinement and luxury in light weight.

To see the car is to acknowledge its exclusiveness.

To ride in it is to appreciate its mechanical perfection.

Scripps-Booth Co.
Detroit, Michigan

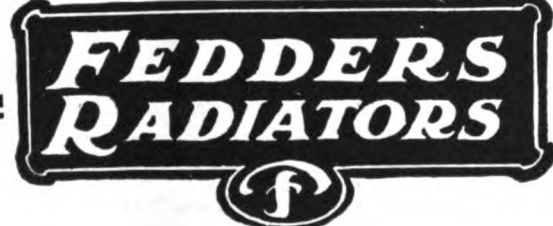




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Made by specialists in the foremost organization for chain design and manufacture in America. Our aim is dependability of service under hardest conditions, and our success in this is shown by the standardization of "Whitney" Chains by the leading motor truck makers of the country.

THE WHITNEY MFG. CO.
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Reground - Exchanged
At an 80% Saving to You

Send us your worn bearings and we will exchange them for reground and refitted ones of correct size. Our complete stock in hand includes all sizes for all requirements. We are prepared to furnish new annular, thrust, radax, double row bearings and high-grade steel balls of all sizes. Special bearings made to order.

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Double Seal Tire Valve
No Tool Needed to Seat or Remove Valve



You can buy the DOUBLE SEAL TIRE VALVE almost anywhere in the form of a complete valve, including stem, core and cap made entirely in our own factory, or you can get the cores only and put them in your present valve stems.



Dealers are finding that these simple, practical devices are not only much in demand, but are netting a fair profit.

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The most simple—the most accessible—the most durable—the most efficient magneto ever produced is the new Type G-4.

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NATIONAL
RADIATORS

The Improvement in RADIATORS
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THINK THOUSANDS OF MILES AHEAD, AND YOU WILL BUY
REPUBLIC MILEAGE
PLAIN AND STANDARD TREAD
TIRES

THE REPUBLIC RUBBER CO.
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BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES.

STEWART
Off-on
TIRE
TOOL

Price
\$1.00

Removes and replaces the most stubborn tire in three minutes. For use on all clincher tires.

For Sale by Dealers Everywhere

STEWART ACCESSORIES COMPANY
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The OLSTAD
POWER FORD TIRE PUMP

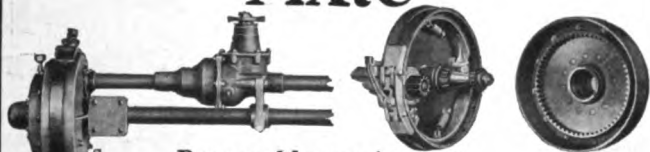
**SIMPLEST
and BEST**

Price **\$10.00** Complete

with Fan and Silent Chain Drive Mechanism. Easy to install.
Agents everywhere—Address

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Russel
Internal Gear Drive
Axle



RUSSEL MOTOR AXLE CO.
North Detroit, Mich.



See the new enclosed Ford cars

The Coupelet, a luxurious two-passenger car, and the five-passenger Sedan, a roomy, stylish family car. Prices of the Ford line. Coupelet \$750, Sedan \$975, Runabout \$440, Touring Car \$490, Town Car \$690 f. o. b. Detroit fully equipped.

Ask nearest Ford branch or dealer about Ford profit-sharing with retail buyers.

Ford Motor Company

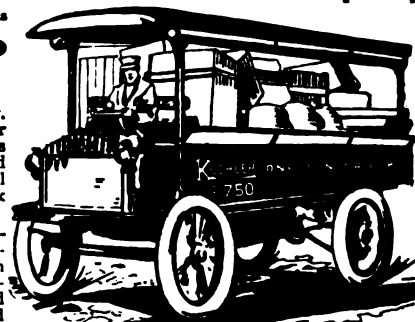
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Greatest Value at Price—Lowest Price at Capacity

That's why the Koehler is
**EASIER to
SELL**

than to sell against. Mr. Dealer: Will it be you or one of your competitors who will make it hard for anyone else to sell any other make of truck in your territory?

Brief Specifications.—Motor—24 H.P., water-cooled, 4 cycle. Ignition—High Tension Magneto. Tires—36 in. solid standard removable and non-skid demountable pneumatics optional at extra price. Tread—58 in. Rear Axle—2 in. square. Force feed circulating oiling system without adjustment. Bearings—Bronze shells lined with babbitt, direct-line drive—emergency gasoline supply. See complete catalog K for details.



KOEHLER \$750
One Ton Truck



JITNEY BUS

INCLUDED. It is but one of the fourteen open and covered body types. There is a highly profitable business in every town, city or village for anyone who establishes cheap motor passenger service.

Completely equipped 14 passenger pay-as-you-enter Jitney Bus, \$875

Send for "JITNEY BUS HISTORY" and Catalog "K."

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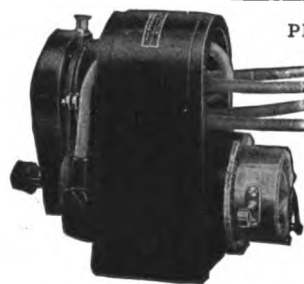
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Agreement on the New
\$1000

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"FOUR"

The **one** popular priced car with
the greatest selling arguments
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INTER-STATE MOTOR CO.
801 West Willard Street
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Berling *The Big Little Magneto*



PROVIDES THE HOT

**SNAPPY HIGH TENSION
IGNITION NECESSARY
FOR THE EFFICIENCY OF
HIGH SPEED LIGHT CAR
MOTORS.**

**FULL SPARK ON RETARD
FOR STARTING AND LOW
SPEEDS.**

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GARCO ASBESTOS BRAKE LINING

Absolutely stops the car. It has a wear-resisting and ever-gripping surface which never glazes and outlives, under heavy service, all other brake linings. Its construction, its materials and its chemical surfacing are unique to GARCO LINING.

We also manufacture ASBESTOS CLUTCH LINING and a full line of Asbestos Textiles, Asbestos Metallic Sheet Lining, Gaskets, and Valve Stem Packing.

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The Otto Konigslow Mfg. Co.
CLEVELAND

A Two-cylinder Tire Pump that gives complete satisfaction is the

MANZEL TIRE PUMP

\$20 Complete with all fittings, including 15 feet of air hose, pressure gauge, etc. Perfect construction, finest materials, most accurate fitting—in short, a pump that eliminates tire worries and the dangers due to under-inflation. Easily attached to most all cars—no drilling—no machine work.

\$20

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Special pump for Ford cars \$7.50

Quick Detachable and Demountable Rims

Our new and improved manufacturing facilities insure quality products and prompt deliveries in large or small quantities.

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Delivers hottest spark at low speeds and a better spark than the magneto at high speed.

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Puts Speed
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"The Livest Magazine in America"

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F. O. B. **\$1475** Factory

Guaranteed 40 horsepower; 118-inch wheel base; 34x4-inch tires (non-skid rears); 5 passenger; spiral bevel gear rear axle, electrically started and lighted, power pump, left drive, center control, completely equipped. 50 horsepower touring, roadster, sedan, limousine models, \$2500 to \$3800.

Write for detailed specifications.

Moline Automobile Co., East Moline, Ill.



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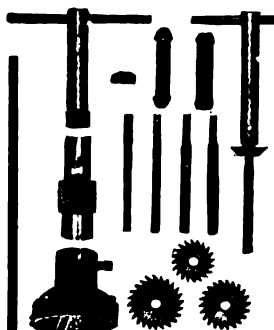
Hyatt Quiet Bearings are used in the majority of American made Automobiles

SERVICE AGENTS

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HYATT ROLLER BEARING CO.
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**Increase Your
Repair Business**



Equip your shop to handle four times the valve grinding work you can now take care of. Put in the one machine that can do the work in one-quarter the time required by hand—and do it better. The

FOSNACHT VALVE SEATER

needs no expert operator. No oil—no emery—no dirt—no tearing down of motor.

The FOSNACHT will build your trade—and give you satisfied customers in every instance. It's to your interest to have it.

You ought to read our free book, anyway. It tells all about this great device. Write for it today—N-O-W!

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Detachable
WIRE WHEELS

"The wheel that makes any car modern"

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Oxy-Acetylene Welding**

Savings made please your patrons and pay good substantial profits.

PREST-O-LITE
Dissolved Acetylene
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adds to the efficiency and usefulness of any good welding equipment. We furnish thoroughly high grade welding apparatus for \$80.00. The average user will also need gas cylinders at an additional cost, and about \$10.00 worth of welding supplies. Truck and special equipment for cutting operations at extra cost.

Send for details of Prest-O-Lite
Service for Oxy-Acetylene Welding

The Prest-O-Lite Co., Inc.
The World's Largest Makers of Dissolved Acetylene
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Here's "Safety First" For Every Garage Business

A SIGN that COMPELS attention and INSPIRES confidence. A positive business getter.

This six-foot, double side, day and night standard garage sign, embodies the results of enormous sign-building experience.

Make yours the well-known garage of your section by installing one. If you can't pay cash, I'll rent you one. Rent to apply towards purchase price.

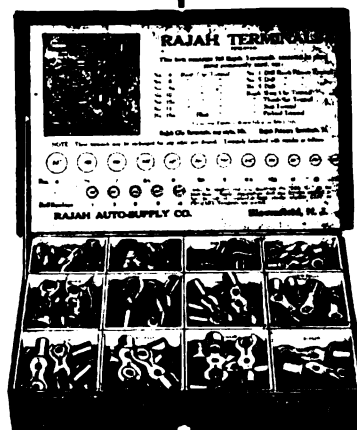
Remember that it pays to advertise and the best advertising you can do is to use this very attractive sign.

Write at once for details and full particulars of my proposition

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Hardware Dealers

Get this box of

RAJAH TERMINALS

For Your Auto Supply Dept.

An efficient, strong and dependable clip connection that will not loosen. Used by leading car and magneto manufacturers. Write for prices, sample and information.

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John Millen & Son, Ltd.,
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HORN and FAN Combined



Something New and Better

No gears, motor, batteries or wires to give trouble. Gives warning signal by merely pushing button at driver's seat. Increases efficiency of fan and motor. Keeps radiator cool. Never fails to sound. Long life. Is easily interchangeable with fan on any Ford in a minute's time. Most reliable and safest horn. Write for dealer's proposition.

Price \$5.00

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Buy Springs Direct From the Manufacturer

Save 25 to 33 1/3%

Get better—prompter service and save money. We have springs for all makes and models of cars always in stock. Orders shipped same day as received. Never any annoying delays if you deal with us.

Write for complete information and price list. We guarantee to save you money.

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(Established 1906)

51-53-55 East 28th Street, Chicago

Lipman All Metal Air Pumps

One, Two and Four Cylinder Pumps
Portable and Stationary Garage Pumps

Pumps with attachments for all leading makes of cars, \$15.00 complete

LIPMAN AIR APPLIANCE CO., 611 Pleasant Street
BELOIT, WIS.

Increase Garage Profits by Stopping the Leaks

Your profits are dripping away because of lack of system

I'LL PLUG UP THE HOLES

by installing a simple, practical system of accounts—and will audit them regularly to see that you are getting all that's coming to you.

Write and Ask Me

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Accountant and Auditor

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It ought to be a regular weekly visitor in your office, Mr. Dealer. \$2.00 per year—a small price for a big value. Subscribe today.

Motor World Publishing Co., 231-241 W. 39th St., N. Y.

HOLMES
Wrecking Truck

Pat. Nov. 10, 1914

When you bring in a wrecked car you need this Truck. In a moment you raise the car with this lever, then strap the Tongue in place, and away you go. Hundreds of garages are now equipped and the way they bring in their customers is a great surprise. One truck for front or rear. Let us send you our literature. You need it.

ROBERT HOLMES & BROS. Danville, Illinois

RACING SEATS

16" wide, 17" deep, 21" high, upholstered, red or black. Price, pair.....\$25.00
Racing gears for Ford cars, 2 1/2 to 1 or 3 to 1 ratio, pair.....\$15.00
Helical cut timing gears for Ford, pair.....\$25.00
Dept. R.

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Buy BETTER Springs

Guaranteed even at the bolt hole NO restrictions. Graphited (for a 2 years' lubrication) between all leaves. At better price than car factories. Get complete 1915 list of 250 numbers and address of nearest Supply Jobber carrying stock, or wire us for any stock number listed.

NEW ERA SPRING & SPECIALTY CO. Try BETTER Springs
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Ask for circulars of other low price Ford Specialties.

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Send for our 1915 Advance Supplement and get your name on our list for 1915 complete catalogue. Will be ready about April 1st.

Chicago Automobile Supply House

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"The Speedometer of Absolute Accuracy"

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Sparton Hand Operated Horns \$4.00, all finishes.

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FIRST
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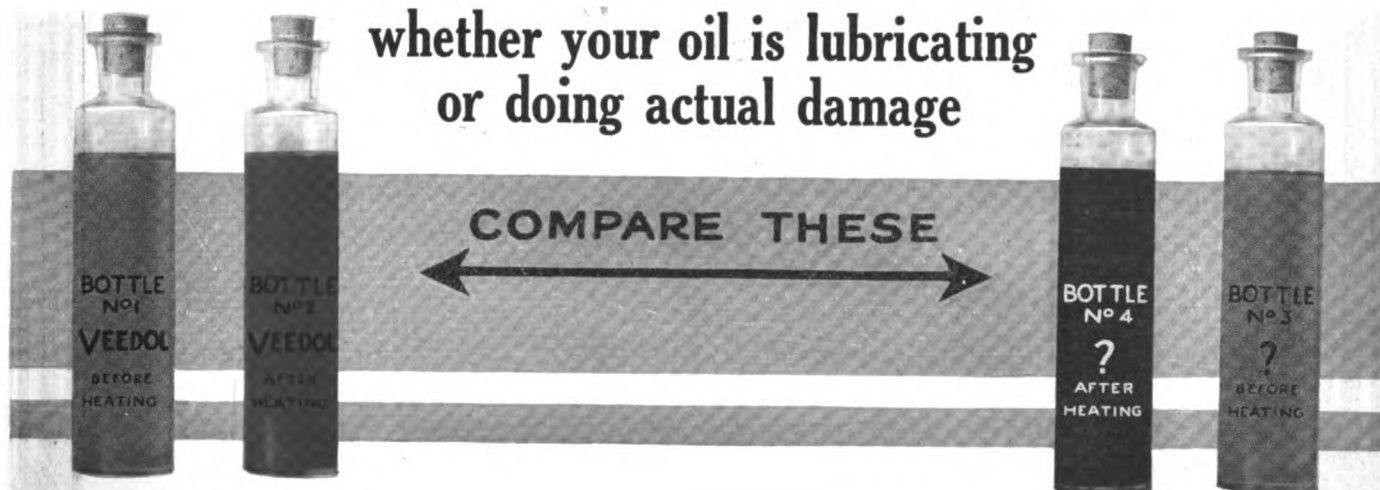


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\$8.00 to \$15.00

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whether your oil is lubricating
or doing actual damage



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BOTTLE NO. 2 shows the same oil after it has been heated to 500° for 15 minutes. It is now a red-orange, but it is absolutely clear and contains no sediment of any kind.

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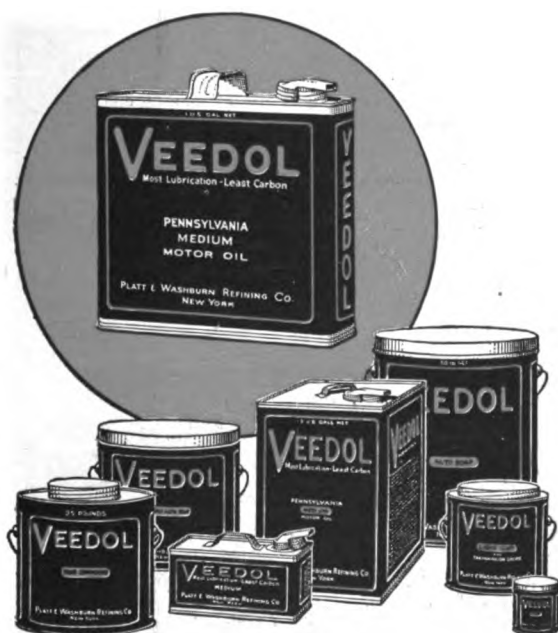
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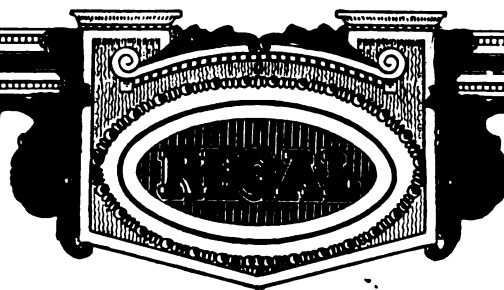
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Electric Lights

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Left Drive

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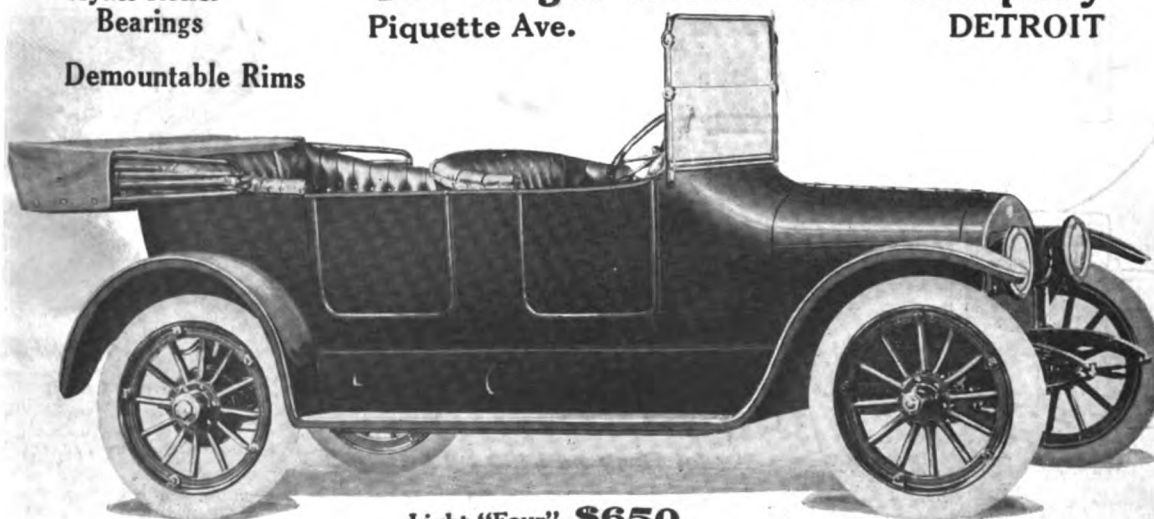
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Remember there are two other sterling models—THREE REGALS in all—all similarly designed, built and equipped.

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A Standard "Four"	1085
A "V" Type "Eight"	1250

All are amply powered—moderately priced—completely equipped—electric starting and lighting included and have beautiful full streamline bodies and crown fenders.

The Regal Motor Car Company
Piquette Ave. DETROIT



Light "Four" \$650

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